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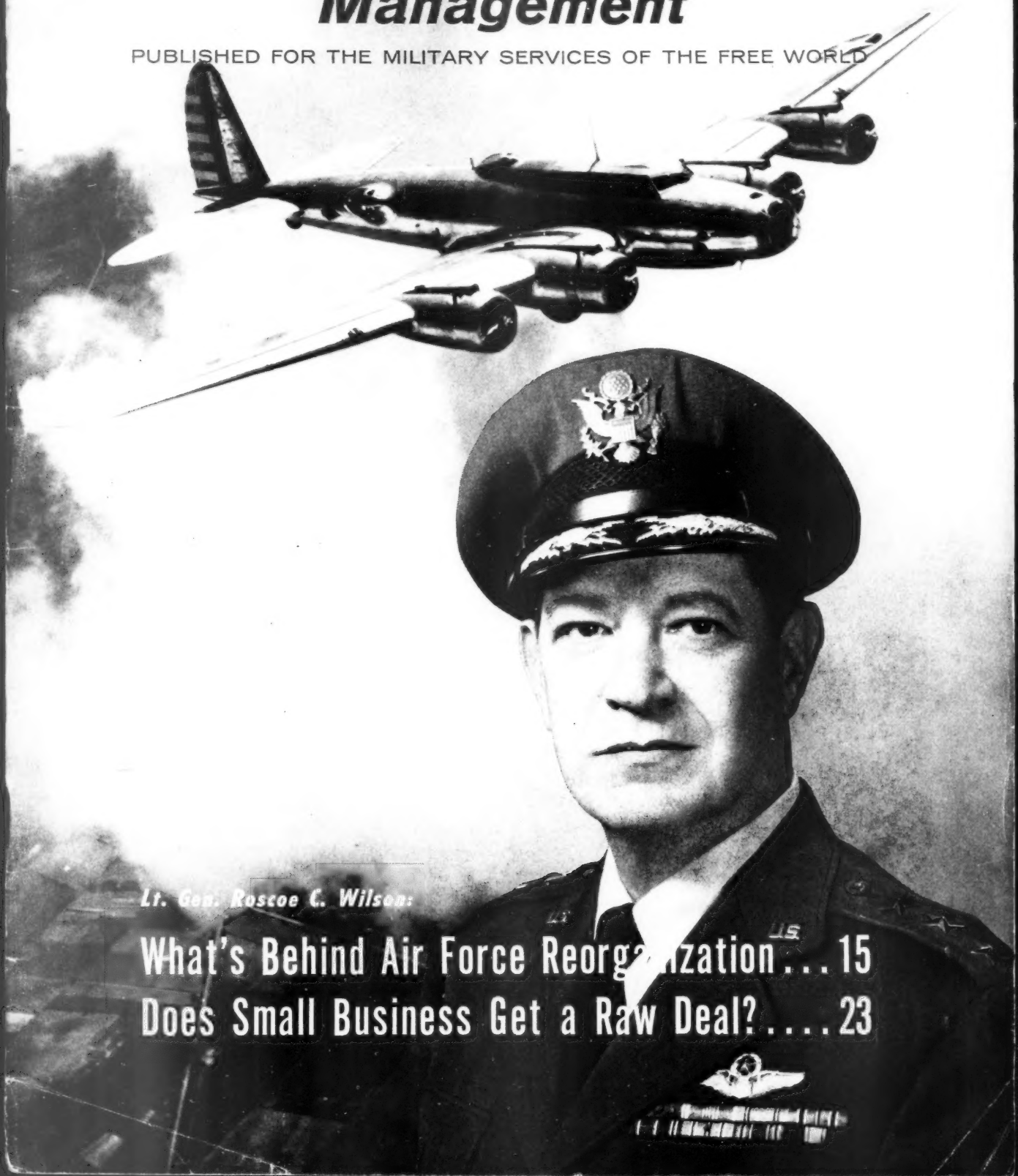

Lt. Gen. Roscoe C. Wilson:

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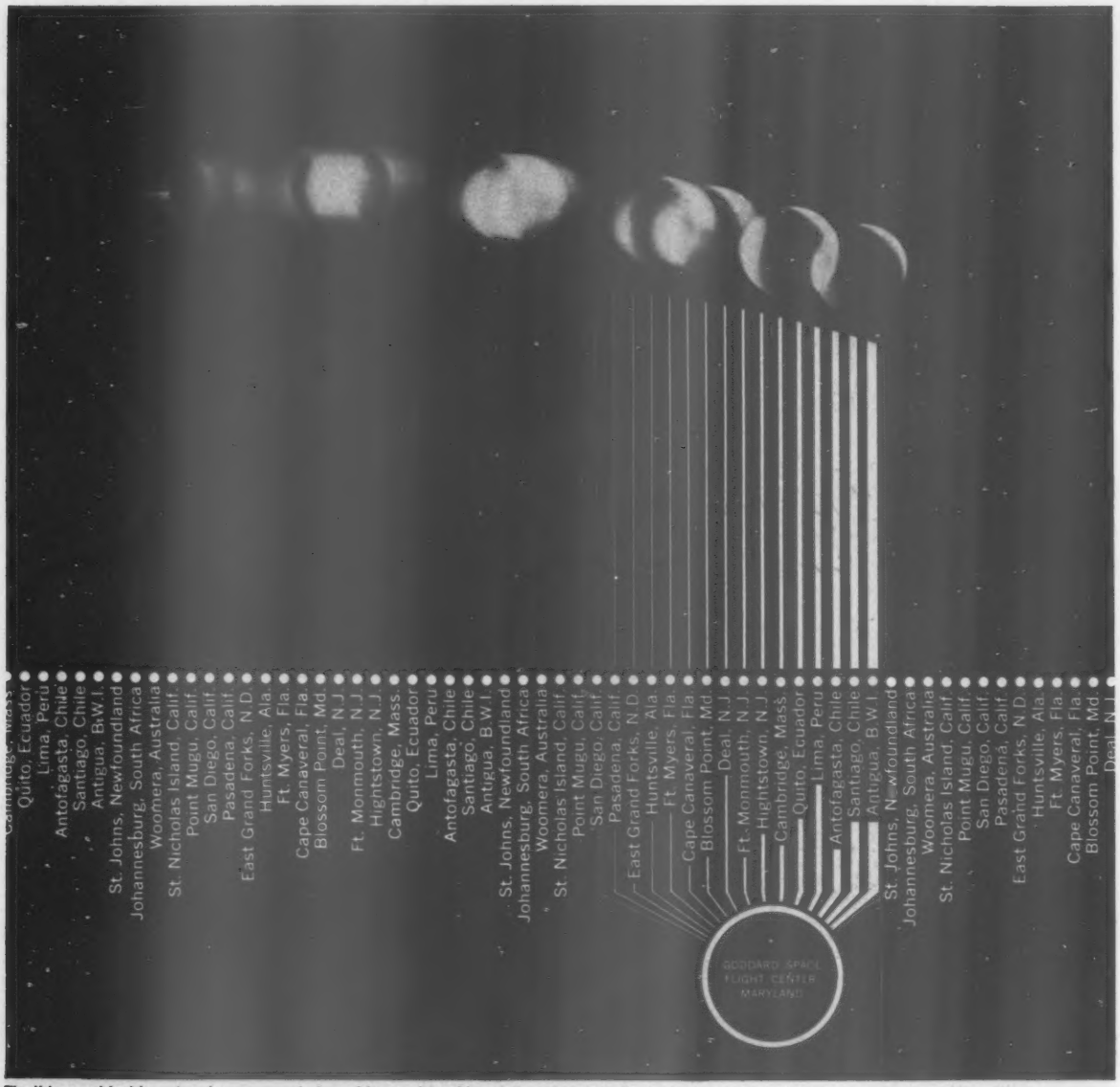

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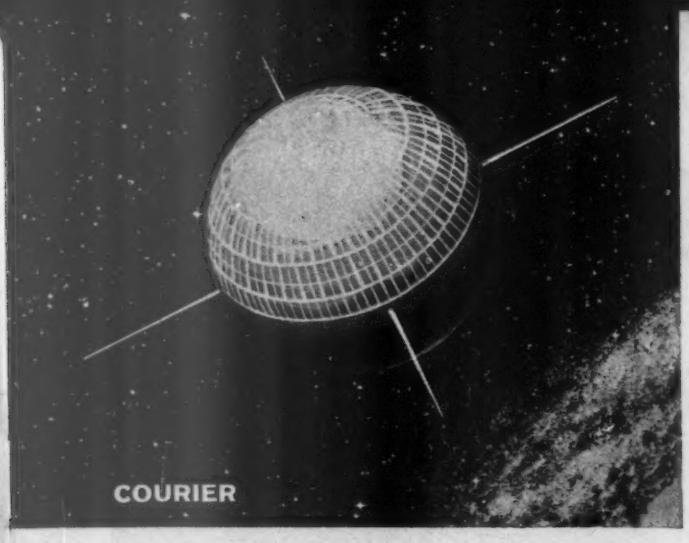

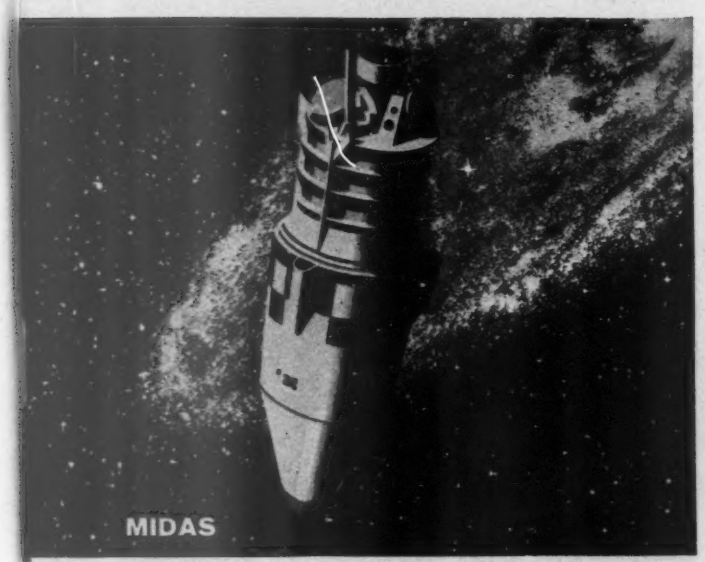

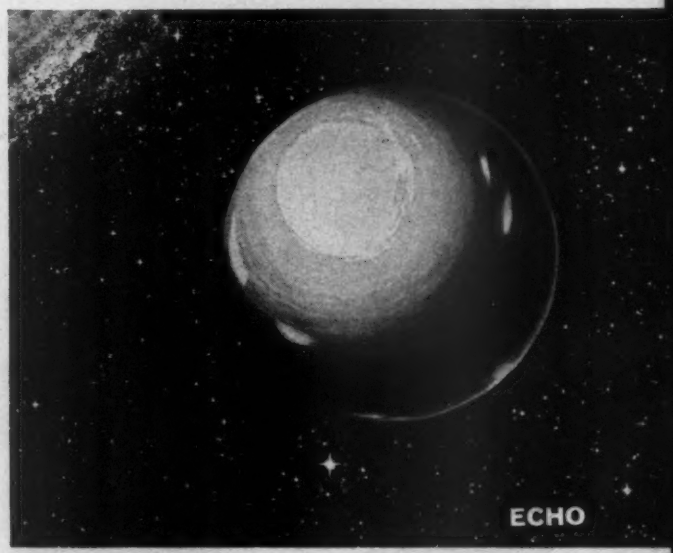

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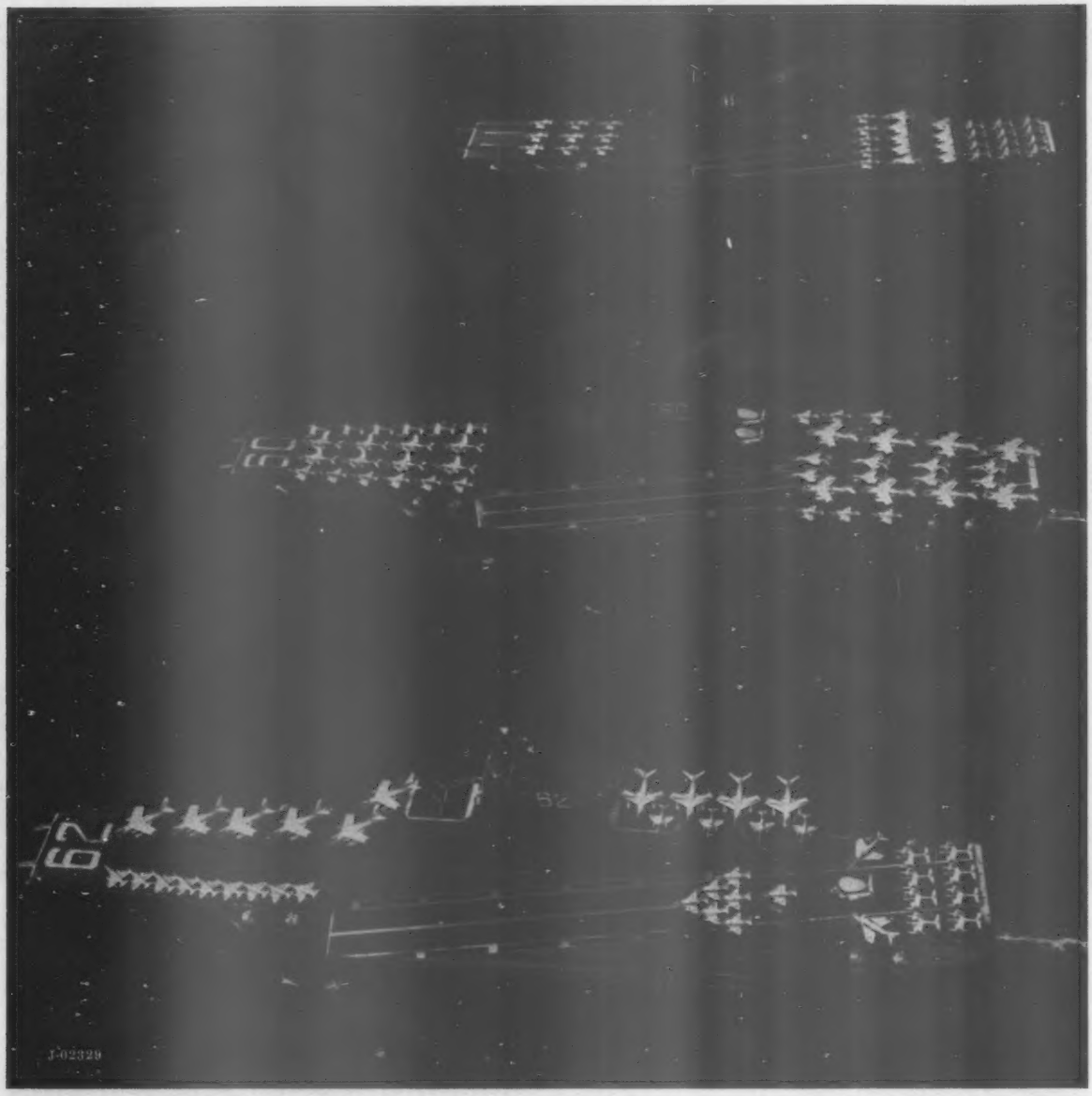

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EDITORIAL

Small Business Revisited

ONE DEAD HORSE in Washington has been beaten so much recently it is hardly even recognizable as a horse anymore. At foaling time, far, far too many years ago, it was registered "The Small Business Problem" by "Crusader for Marginal Causes" out of "Political Campaigner."

As nearly as we can determine from an informal telephone poll, there is a growing legion of small businesses who would dearly love to plead with the Congress to "please not help us anymore. We're going broke."

True, all vote seekers like to put themselves in the position of being a champion for the underdog and there is no more natural spot for this role playing than the "small business" arena. But the boys in it are all working so hard that, in effect, they are doing their best to help small business into an early grave.

Defense Secretary McNamara's *order* (not a request) that Defense will let 10% more dollars to small business this year than it did last is an admirable decision. But it won't be easy to live up to. Pulling the problem out of the political snakepit for a moment, there are several reasons why a 10% boost will be a tough hurdle. Among them:

(1) Small business itself is growing more reluctant to deal with Defense. Accepting a contract frequently means a large investment in facilities, manpower, etc. And subsequent cancellations, a likely bet in the hot-and-cold Defense market, can destroy small firms involved. Main reason: they haven't the reserves or broad base of the big primes to draw on in case of disaster. (This trap has already bankrupt several firms which were doing a land office commercial business before Defense gave them the kiss of death.)

(2) Particularly in the prime contract area, more and more, there just aren't any projects cranking up which small business has the wherewithal to handle.

(3) Small business is not really "small business." It is a definition. And firms at the top borderline of the definition frequently no longer qualify as "small business" if Defense gives them a contract. Consequently, the more of these people Defense takes care of one year, the fewer of them there tend to be the next year. (One easy way to cool off the current debate would be to change the definition.)

But for all this, probably the most onerous aspect of the current debate is that the problem has been twisted out of all proportion to reality. Inhabitants of Capitol Hill seem to want to insist on leaving the inference with the American public that Defense is sleeping with big business and trying its best to clobber the little guy.

And now, apparently, the politicians are taking their own propaganda seriously. Result: they just may make a real mishmash out of the whole problem. One way: the proposed legislation which would, basically, give special interest outfits (with no responsibility for national defense) the authority to approve Defense procurement decisions. Predictable outcome: a truly horrendous procurement operation.

We suggest the vote hunters be allowed to talk all they want—but let's not rattle the buying machinery except on the strict basis of facts.

Certainly, on an unemotional basis, it is difficult to see how Defense is ever going to do "significantly better" by small business. Assuming: (1) that the military's first obligation is to get the best deal for national defense, and (2) that the hardware-buy decisions are always going to be in a state of extreme flux.

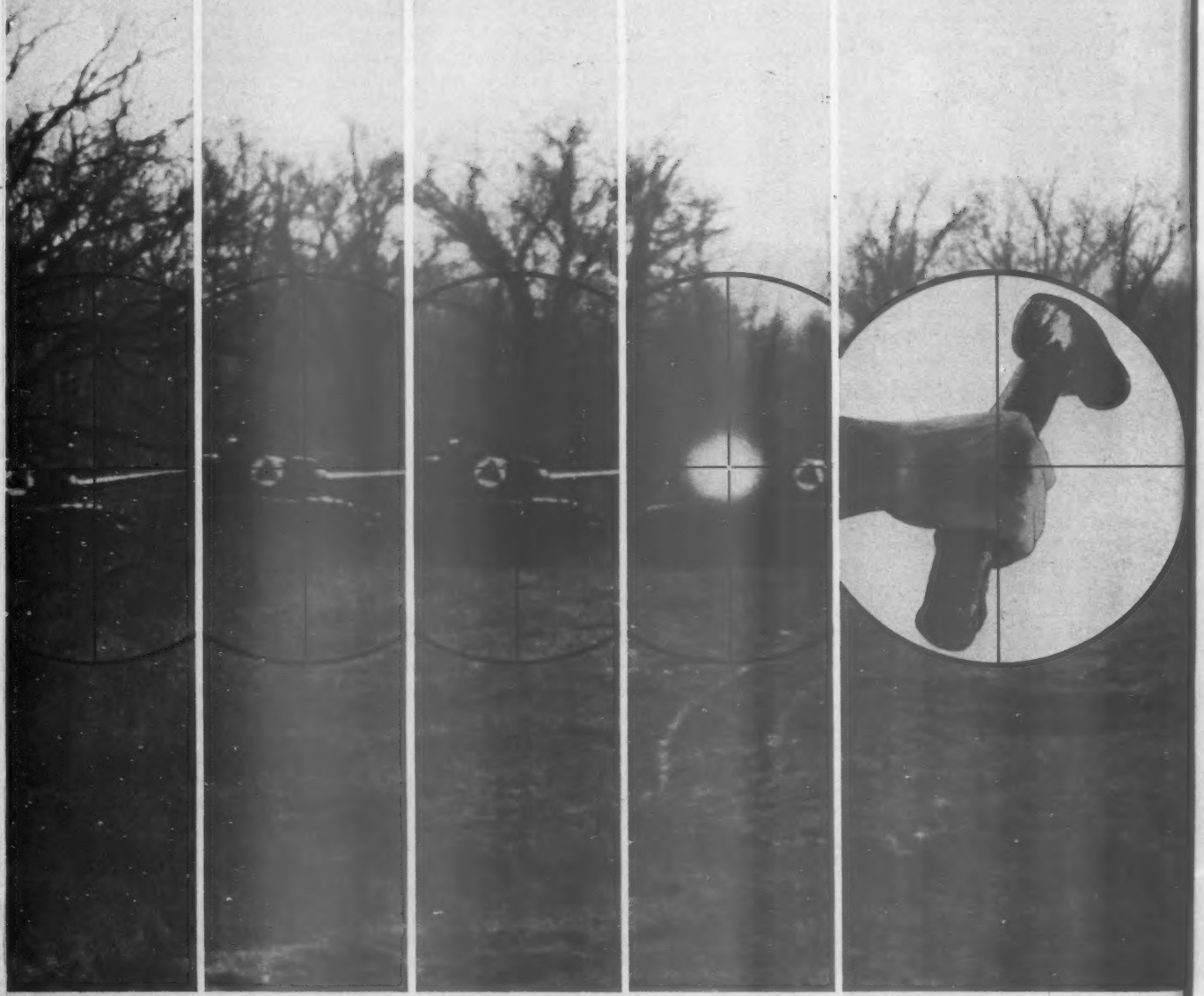
In perspective: all *facts* considered, Defense's desire to help anyway is hardly likely to become a prophet's zeal—not if their every effort is rewarded by castigation and the smear charge of connivery.

As the old hands around town will privately admit, it's always dangerous and even occasionally inaccurate to launch a crusade by impugning the motives of any Washington government organization—except those of politicians.

Bill Borklund

SHILLELAGH

U.S. Army Missile System



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Actual undersea photo of telephone cable off coast of Florida.

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ARMED FORCES Management

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FEATURES

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The Air Force Deputy Chief of Staff for Development provides background on the reorganization of management of research and development. On the basis of broad experience in the Air Force development area, he feels this action will produce a number of beneficial results. Among them, Gen. Wilson lists concentration of responsibilities coupled with more complete facilities control.

Air Force Functions Shifted: Three New Commands 17

The Air Force has reallocated the functions of the Air Materiel Command and the Air Research and Development Command to three new organizations: the Air Force Systems Command, the Air Force Logistics Command and the Office of Aerospace Research. This report presents details and charts of the shifts.

Is Small Business Getting a Raw Deal? 23

The Administration has directed that Small Business receive an appropriate share of Government contracts. Defense contracts are the most prolific source of Government procurement dollars. This report spells out what each of the military services is doing for the small business man.

Hands Off Defense Patent Policy! 35

An industrial specialist on patent problems takes issue with proponents of plans to give the Government the rights to patents emanating from Defense contracts.

What Civil Service Needs: Real Career Program for Executives 42

The career program advocated here is designed to attract and qualify Civil Service personnel for executive posts up to the level of Department Secretary.

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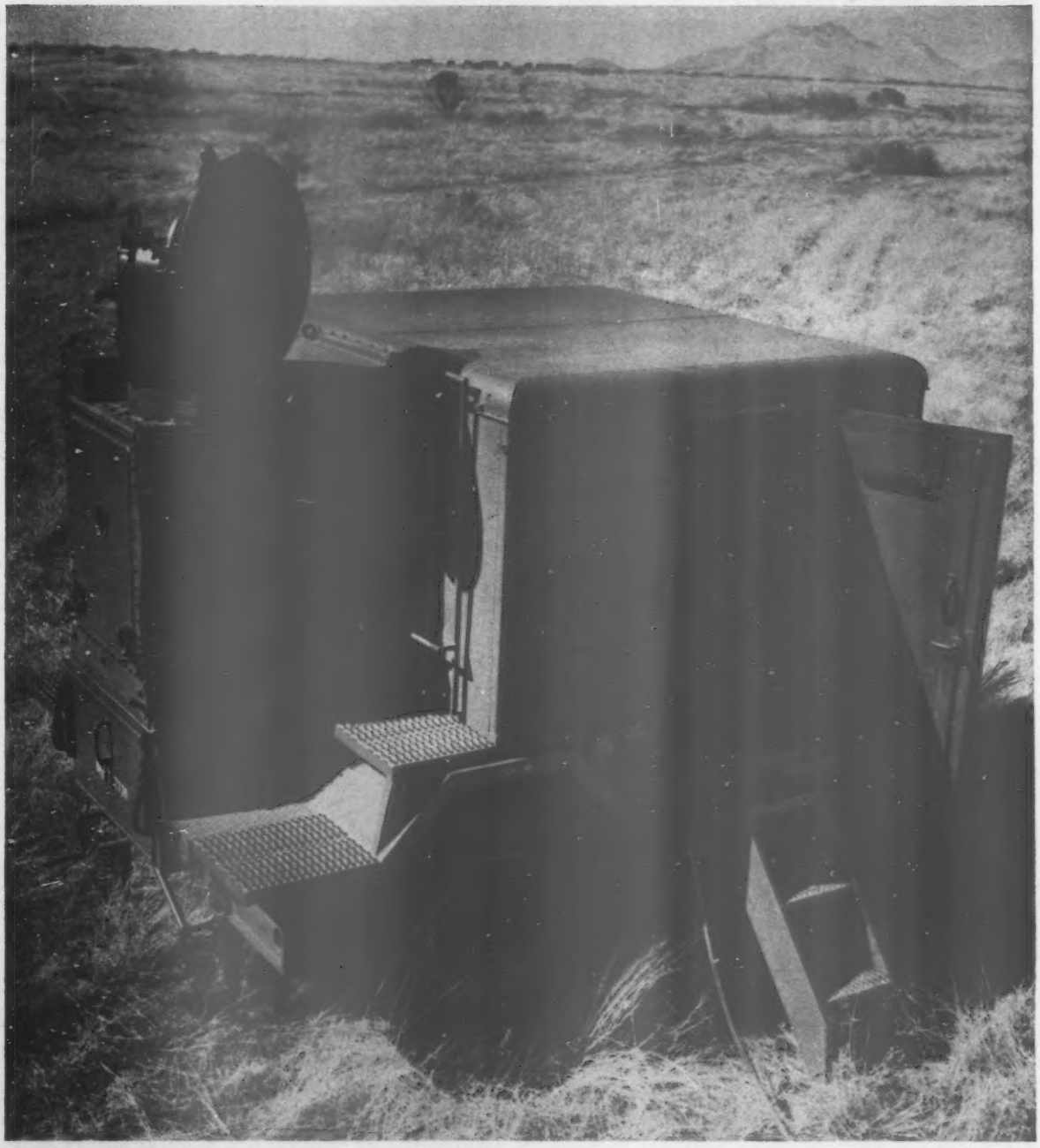
Has Military Mobility Program Bogged Down? . . . Positive Side of Procurement . . . ASTIA: Why Our Sources of Scientific Information Are Fouled Up . . . British White Paper Details 1961-62 Defense Spending Program.



The pilot is inside, flying over enemy lines.

The SD-1 Surveillance Drone flies remotely controlled tactical surveillance missions without risking manned aircraft or pilot. It is extremely mobile, simple to use and maintain, and can be readily adapted to carry TV or film cameras, infrared, radiation detection or radar reconnaissance equipment. The SD-1 is the Army's only operational surveillance drone. Northrop's Radioplane Division developed and produces it.

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Washington Background

McNamara Steps On Service Toes

Echoes across the Potomac indicate the traditional two month (or so) "be nice and don't argue" honeymoon between a new Secretary of Defense and the veteran Pentagon staffs is about over. However, in contrast with past experiences, McNamara is setting such a fast pace that military staffs in particular are having trouble getting close enough to corral him. Among his more notable "course records:"

Secretary Speeds Decision

Item: Following some extensive homework on his own, he made a decision on a major Air Force weapon system 20 minutes after his briefing had started.

Army Argues, Marines Win

Item: He assigned a "patrol action" job to the Marine Corps ten minutes after Army spokesmen had spent an hour telling him why they ought to have the job.

Services Belong To OSD Staff

Item: Called for a meeting of his staff to brief him about "what's going on," saw that only his immediate OSD staff had shown up, issued an order immediately to get the three service secretaries in on it, too. His significant comment: "They are also part of my staff."

Defense Can Work On Own Authority

Item: Has already begun work on a marriage of the Strategic Army Corps and the Tactical Air Command into a single functional limited war fighting unit. This adds new credence to a contention first voiced in these columns some months ago, i.e., that the Defense Secretary has more than enough power to effect a great deal of further, far-reaching unification without first getting Capitol Hill permission.

General Learns Ford System

Summed up one general officer: "He is really piling on the work. I understand how he used to operate at Ford—keep throwing more and more stuff at you until you break, to find out if you can produce or if you can't."

Brains Are Restive In Military

How to retain outstanding engineering and scientific talent has been a long-standing problem for personnel officers in the top military echelons. Numerous studies indicate that those with the best brains who stay with the military services do so, in almost all cases, for other than financial reasons. However, the services may inadvertently be losing their appeal to budding brain power. Particularly in the Navy, this trend is becoming apparent—mostly through gripes, not formal complaints. The criticism focuses on the policy of alternating a tour in a specialty with a tour of manning a ship. One top-flight Navy commander commented: "More than anything else, I want to be a *Navy* engineer. But if they won't let me be an engineer full time in the Navy, I'll be an engineer some place else."

Defense Eyes Army Groups

Army organization and procedures is one of more than 100 service areas now under scrutiny by Secretary McNamara. Among the answers which he wants right away are those to questions on personnel, logistics, research and development, and the technical services. Richard S. Morse, the outgoing Assistant Secretary of the Army for Research and Development, gave Defense the answers on the Army's technical services almost a year ago. At that time, Morse—whose resignation is expected to become effective about June 1—reported finding among other things duplication of effort, parallel projects, and overlapping jurisdictions.

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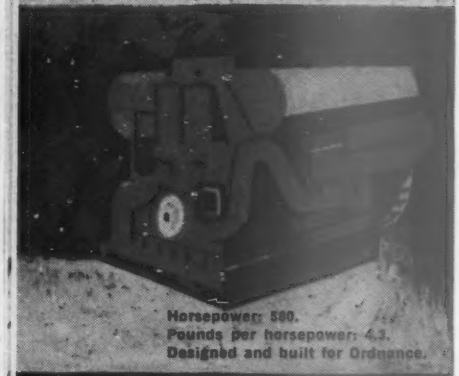

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AN EDITORIAL ANALYSIS

Flimflam on the New Frontier

SHORTLY BEFORE HE MOVED into the White House, President Kennedy stated rather clearly that the Free World needed a new goal: not just stalemating the cold war, winning it. To reach this goal, his plans in the economic, political, and sociological arenas may be very sound.

But he also indicated that, as always, we would rely on a strong military force for protection, until and unless State could develop a workable, enforceable disarmament pact with the communists. Fine, except that from their quotes to Congress, recently, it is quite apparent that the Administration doesn't yet know, in fact, just what kind of insurance it *does* want.

More specifically, the script reads as if someone from the counterforce school of military strategy wrote it while somebody from the city-busting, finite deterrence school was selecting the hardware.

Among the Anomalies:

Item—Missiles. While justifiably lauding Polaris, for its strategic advantages (essentially, mobility), they have cancelled the mobile Minuteman in favor of holes in the ground. And even beyond that, while re-iterating the "biggest bang for a buck" theory, they cut back the Titan II program designed to deliver it.

Item—Aircraft. While announcing an augmented airborne alert of the B-52 (because "it must survive if we are to win"), they cut the B-70 to a limping R&D operation, scratched the B-58 and virtually guaranteed that there will be no follow-on once the B-52 wears out—in three years or so.

Item—No mention of C-B-R. Any expert in this pacifist eyewash called "stable deterrence" can tell you "bacteria are cheaper and more effective than missiles—and they're controllable absolutely."

Item—The Future. Naturally, in a muddle like this, it is little wonder that there is considerable confusion over where it all leaves such things as Nike, Zeus, anti-submarine warfare, pre- and post-attack reconnaissance, strategic hunter-killer weapon systems, and the like—all of them counterforce hardware.

And underlying all this smog rising out of the Pentagon lately, there is something worse: indications that many of the potential military weapon systems of the future, now cancelled, received only a cursory glance on their way to guillotine.

Case in Point: ANP

Most obvious example: Aircraft Nuclear Propulsion.

It is not necessary even to delve into the military subtleties of the "counterforce versus world de-population" strategy debate. ANP's capabilities to perform, in theory, a host of necessary military activities are awesome and unmatched—or so say the experts.

Further, enough technical knowledge has been developed by the Atomic Energy Commission, the Air Force, and industry so that even in those few areas where they don't yet know the answers, they now know where to go to find them. In theory, this is all that should be necessary to crank up a full scale weapon system development.

But management has flubbed.

Mistake No. 1—The program has never been allowed to run on an even keel, even though any technical program manager will tell you this is an absolute necessity for best results.

Sub-flub No. 1—Management has never developed nor written down any clear requirement on where ANP should fit and when and for how much. The reason: the experts haven't yet been asked to—which is part of the problem.

Sub-flub No. 2—Until 1959, resources provided to ANP hopped up and down like Mexican jumping beans. Not only is this poor top management of itself, but it has prevented ANP from laying out any sensible schedule of program mile-stone charts, a la Polaris. Significantly, the program's "greatest technical success has been achieved in the last two years when funding has been stable and reliable."

Mistake No. 2—Within the last three months, the ground rules have been changed. ANP was thrown out the window on the grounds that "the aircraft involved would have had little or no military value. It would almost inevitably have been subsonic and limited to an altitude of 35,000 feet." This is specious pap. The reason: in 1959, Defense laid down exactly those parameters and all the ANP crew has done is follow orders.

(In effect, Defense management's goof here amounts to telling General Motors to build a six passenger automobile, then refusing to buy because it hasn't the goods-carrying capacity of a semi-trailer truck.)

Mistake No. 3—Allowing men with authority, but no responsibility for the program, to evaluate it. This would be all right except that the men who did the evaluating had neither technical background nor military tactical expertise. Moreover, reportedly they were already convinced before they looked that "ANP is just no good."

Mistake No. 4—Even pitfall No. 3 could have been avoided, except that, as far as is known, the Secretary of Defense has not gone the full, "smart management" route by asking the men in charge of the program for a rebuttal. In effect, at best, he has heard only half the story and, at worst, he is guilty of accepting bad advice without checking.

Mistake No. 5—Ultimate approving authority (particularly on Capitol Hill) contains, among the most vitriolic opposition to ANP, several knife wielding individuals who haven't even bothered to try learning what the program is all about or where it stands.

It is hardly surprising, as a result of all this, that many of the public statements on why ANP was cancelled are, at best, no more than half accurate. ANP, we feel, deserves something better than a rigged hearing.

More to the point, if Defense top management has given all weapon system programs the same sketchy evaluation it doled out to ANP, there are potentially an awesome number of loopholes in the planned structure of tomorrow's military establishment.

In this cold war no-limit poker game, bluffing against a pat hand with only a lot of rosy-hued conversation is no way to avoid bankruptcy.

C. W. Borklund

PENTAGON PROFILE

Lt. Gen. Roscoe C. Wilson

Deputy Chief of Staff, Development, USAF

AF Soft Spots Caused Reorganization Shifts

Scientist, scholar, soldier, airman—these are only four of the many roles that this key member of the Air Force top command has assumed with distinction during his multi-faceted military career. As Deputy Chief of Staff for Development, he speaks with authority in his endorsement of the reorganization now under way in his area of responsibility.

Army Lt. Wilson readies for the open cockpit of an O-38, Wright Field, 1932.

When "Bim" Wilson left Centralia, Penna., in 1924 to enroll at West Point, he forgot to notify his local unit of the National Guard. The Sheriff of his home town promptly threatened prosecution.

"That was my first experience with bureaucracy," says Lt. Gen. Roscoe Charles Wilson, now Deputy Chief of Staff for Development, U.S. Air Force. Ever since then, he has had little patience with stumbling blocks established arbitrarily.

This is one of the reasons why he thinks the Air Force has a good thing in the reorganization of its research activities under the new Systems Command.

"It will get all the tools to the individual who has the responsibility," the General says. "Then he has no place to hide because there won't be any room for bureaucratic dodges."

The new organization represents a big change for the Air Force, the 55-year-old development chief points out. Previously, procurement was separate from systems design, development and acquisition. Differences of opinion existed between procurement and development people on how contracts should be executed. This led to divided responsibility and difficulty in fixing blame if things went wrong. Under the new arrangement, the systems development man gets the project and the tools he needs as well as the responsibility for doing the job.

Another important aspect of the new command emphasized by the General is that research—both basic and applied—is given equal status with systems development. There was a tendency previously, he says, for the research program—including applied research—to become subservient to systems development with the result that there was a risk of neglecting research in the push to get the job done.

The concept of concurrency which has paid such tremendous dividends to the Air Force—particularly in the missile area—will continue, Gen. Wilson says. However, concurrency will be restricted to systems development and will not be used in managing research. The objective of the Air Force is the improvement of the quality of research and the acceleration of its pace.

In the General's opinion, the gains to be made under the new organization can best be seen from a broad point of view. He sees the nature of the world struggle changing with a new phase ahead. "A decade ago," he says, "we built great in-being strength to preserve the peace. We have maintained and are maintaining that strength. We are modernizing it and advancing into a new era in military power. Soon we will be emphasizing technology more than ever in an effort to find new advances, significant advances."

The new organization is expected by the General to permit the Air Force to give technological support to in-being strength, modernization and to future advances. It will try to bring new types of strength closer in time and faster than before, he says, and will give greater order to technological strategy and planning.

"It is essential that we develop our fundamental knowledge and improve techniques," Gen. Wilson explained, "in order to replenish what we have depleted. A certain amount of applied research cannot be divorced from our systems program structure. We must try to increase the quality of our research but we cannot dilute the limited amount of talent available. We must try to get ahead of the systems people and keep ahead of them. We will try to have our cake and eat it too."

General Wilson's career in research and development can be traced back to 1932 when he studied at the Army Air Corps Engineer School at Wright Field after flight training at Brooks and Kelly Fields and assignment at Mitchel with the 1st Observation Squadron. This led to the design, test and research laboratories at Wright just about when Marshal Italo Balbo, of the Italian Air Force, was making bomber history with a mass flight of 24 Savoia-Marchetti twin-engined aircraft from Rome to Chicago for the World's Fair. The Balbo achievement gave impetus to a Wilson project which resulted in development of the B-15, the B-19 and eventually the B-17, earning the General the title, "Father of the Flying Fortress."

In addition to this title, the 1933-34 bomber research project also earned him title to a number of basic patents for "ornamental design." These cover the B-15, B-17, B-19, P-39, and P-63. "Ornamental design" patents are issued to protect the Government against infringements and General Wilson hastens to expain that they have

to be issued in some individual's name and "I just happened to be it." Gen. Wilson still has the records of his computations and design studies on the B-15.

In June, 1943, the General was appointed AAF project officer in support of the Manhattan Engineering Division. One of his many contributions to the Manhattan Project was his selection of the site of the first atomic bomb detonation at Alamogordo, New Mexico. Later he organized and equipped the unit that carried the bombs to Japan.

His name was memorialized again in 1945 by the National Geographic-Brazilian Eclipse Expedition. The airfield and camp site which the General arranged for the expedition at Boca Uva, Brazil, was designated "Wilson Field" as a token of esteem. So far as is known, General Wilson is the only living American military aviator who has an airfield named for him.

General Wilson twice had scholarly tours as Professor of Philosophy at West Point and from 1951 to 1954 was Commandant at the Air War College, Maxwell AFB. In 1944 and 1945, he was Chief of Staff of the 316th Bomb Wing, operating B-29s in the Pacific, and from 1954 to 1957 was in command of the Third Air Force in Europe.

Otherwise, his career adhered to the pattern of top-echelon research. Included were assignments to the Materiel Division, Army Air Forces; Research and Development Division, Army Air Forces; Armed Forces Special Weapons Project; Military Liaison Committee to the Atomic Energy Commission, and Weapons System Evaluation Group, Department of Defense. He was named to his present post in June 1958.

General Wilson does not carry his job with him when he leaves the Pentagon at night for his quarters at nearby Bolling Air Force Base. Although he says he does some of his "more elaborate thinking—if not the best" at home, he definitely is not a brief case lugger and he keeps his paper burdens at a minimum.

Instead, the General prefers to relax with painting and historical research. He has never exhibited his art work professionally, but those familiar with his talent say he is exceptionally capable with both oils and crayon. He is known as an authority on historical lore.

He is particularly proud of a collection of statuettes of the English sovereigns from King Harold and William the Conqueror complete to the reigning Elizabeth. He is also the possessor of a rarely complete collection of miniatures of the 25 Barons of Runnymede who were sureties for the *Magna Charta*. Guarding these treasures at his Bolling home are 11 miniature brass cannon, antique models of some of the most historical weapons in Europe.

Art is one of General Wilson's avocations. Adept with pad and pencil, he sketched this sequence during a coffee break.

The Wilson family tree boasts soldiers who have fought in every war since the American Revolution. The General's great-great-great grandfather, Capt. Conrad Weiser, lost his scalp while leading the militia along the Susquehanna River against the Indians and British at the massacre of Wyoming Valley in 1778. "That's why I'm careful of ambushes," General Wilson says. His maternal grandfather, Capt. John Richard Porter, who served with the 48th Pennsylvania Infantry in the Civil War, had the distinction of never retiring from the Union Army. He was still on active duty when he died at the age of 94.

The General began soldiering when he joined the California National Guard as a San Francisco high school student while his father, Col. Everett R. Wilson, USA, was stationed at the Presidio. The Wilsons returned to the family home at Centralia on the Colonel's retirement from the Army, and son Roscoe joined the Pennsylvania National Guard before entering the U.S. Military Academy.

One of the General's two sons, Charles Everett Wilson, is a Captain in the Strategic Air Command. He is married to Helen Hobbs, daughter of Capt. Allen Hobbs, USN. The other son, Richard Lee Wilson, is a student at Maryland University.

In addition to his scholarly avocations, General Wilson enjoys games and plays for keeps. Justified or not, there are those who say he is "the best gin rummy player in the Air Force." Companions on long air flights certainly can testify to his prowess. He plays to win even as a spectator. When Army tied Tom Hamilton's Navy football champions 21-21 at Chicago's Soldier Field in 1926, Admiral Harry Sears asked Gen. Wilson: "How lucky can you get?" The General replied: "We were robbed."

The mirror is regarded by General Wilson as a sort of mystic symbol of his philosophy. "It gives you back just what you put into it generally," he says, "although sometimes it may be a little distorted." In extension of this thesis, he is a firm believer in the delegation of opportunity as well as authority. "The man who does the job should get the credit if he's going to get the blame," he says. "We get the best by recognizing an individual's capabilities and putting him in position to obtain recognition."

General Wilson rejects change for the sake of change. "Let's retain the things that are sound," he says. "There are all kinds of explosions taking place in science and technology. If we are going to exploit our opportunities, we must modify our management to keep pace. The leisure we once enjoyed is gone. We must find new ways to get our knowledge, we must avoid the hazards of bad decisions based on incomplete data. We must seek proven techniques, but they must be streamlined or methodology may cost us our gains."

General Wilson subscribes to three goals for Air Force operation and they are co-equal: first, speed-up in weapons acquisition; second, improvement of environment for both applied and basic research, and third, greater emphasis on the war of technological maneuver.

"To accomplish these goals," he warns, "we have got to streamline management, and cut out duplication, dead wood and unnecessary reviews—all those activities that cost time without enhancing achievement." ■

Air Force Functions Shifted

Three new commands with specific jurisdictions over R&D and production functions have been created by the reorganization of the Air Materiel and Research and Development Commands. One of these, the Air Force Systems Command, will direct all activities for acquiring and developing aircraft and missiles from applied research through system production.

by Paul Conlin

Lt. Gen. B. A. Schriever

Now Systems Commander, he adds production to his former ARDC job assignments.

Reorganization of the management structure in Air Force research and development is proceeding on schedule and will be completed by June 30. It calls principally for a radical shake-up in the Air Materiel Command and the Air Research and Development Command and is tailored to eliminate duplication of effort and overlaps in jurisdiction.

Already, the Air Materiel Command has been redesignated the Air Force Logistics Command and the Air Research and Development Command is now known as the Air Force Systems Command. However, the commanders and the headquarters of the two organizations remain unchanged. They are, respectively, Gen. Samuel E. Anderson, Wright-Patterson AFB, Dayton, O., and Lt. Gen. Bernard A. Schriever, Andrews AFB, Maryland.

The Air Force said the reorganization "is designed to provide management improvement through straightforward realignment of functions and responsibilities and through redistribution of associated resources."

There is little doubt that the objective is to produce results and to produce them as speedily as possible, particularly in the Space Program. As spelled out by the Air Force, the specific aims of the reorganization are to:

1. Provide rapid decisions and accelerated actions for all designated system programs.

2. Insure efficient, responsive management of the Space Development responsibility recently assigned to the Air Force by the Secretary of Defense.

3. Provide for the close integration and participation of the Army Corps of Engineers in the Ballistic Missile site activation task.

4. Provide for effective liaison and active participation by Army, Navy and the National Aeronautics and Space Administration on projects being developed for those agencies by the Air Force.

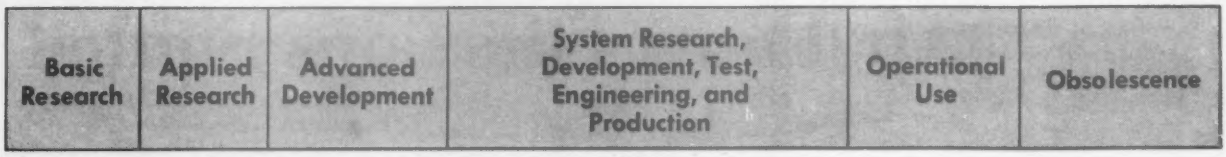
Echoes of the arguments on whether a missile gap existed could still be heard when recommendations for the management reshuffle were drafted by Air Force Secretary Eugene M. Zuckert and his Chief of Staff, General Thomas D. White. These were approved promptly by Defense Secretary Robert S. McNamara and the reorganization was under way.

Involved are new commands, new divisions, new titles and a wholesale reallocation of responsibilities. In brief: all activities in connection with acquisition and development of aircraft and missile systems will be consolidated in the new Air Force Systems Command; the multi-billion dollar support of the entire Air Force world-wide will be operated and controlled by the new Air Force Logistics Command with a strength of about 165,000 persons; the new Office of Aerospace Research will take over the research elements of the ARDC, will operate as a separate agency reporting directly to the Air Force Chief of Staff, and will assume the procedural functions and responsibilities of a major air command.

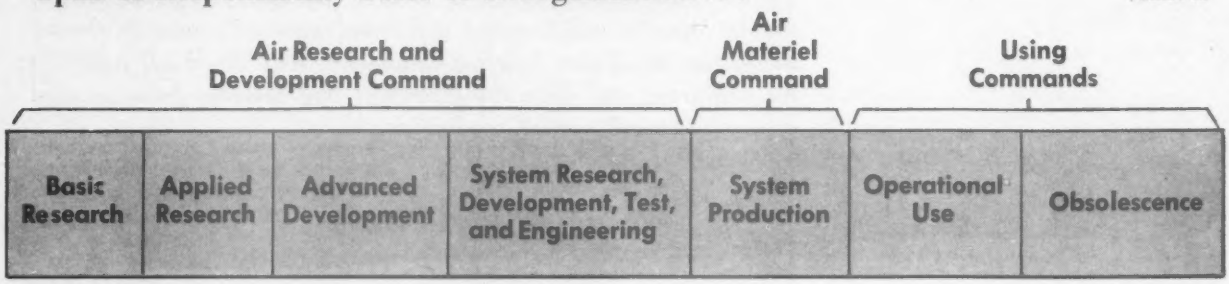
The scope of the changes already made or about to be made can be realized by reference to the earlier management arrangements by the Air Force in weapon and support systems.

Originally, the life cycle of an Air Force Weapon and Support System could be traced through six stages: basic research; applied research; advanced development; system research

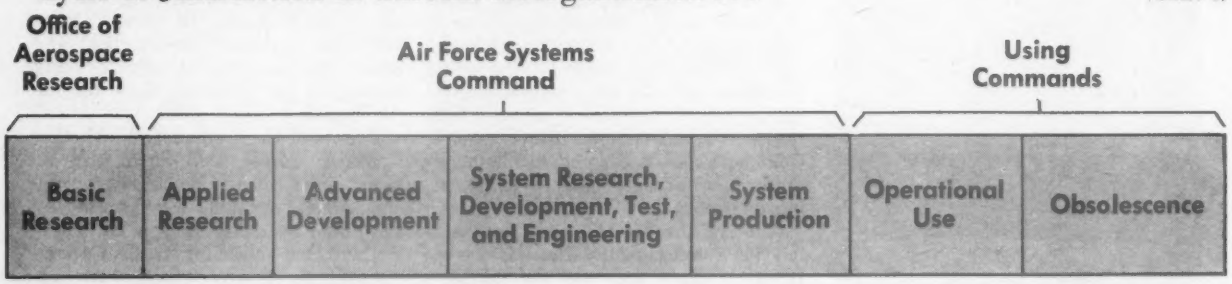
Original Cycle of Air Force Weapon and Support System . . . *(Chart 1)*



Span of Responsibility Prior to Reorganization . . . *(Chart 2)*



Cycle of Jurisdiction in Current Reorganization . . . *(Chart 3)*



and development, test, engineering and production; operational use; and, finally, obsolescence (*See Chart 1*).

The flow of activities which begins with invention or discovery and ends in the scrap pile covers a considerable period of time and a multiplicity of actions. Therefore, it was impossible to draw fine lines of distinction between the various broad categories illustrated in the cycle. Basic and applied research were often intermingled in one project as is normal in any laboratory. System development was not and could not be separated from operational use.

The Old Stages

For the past ten years, the life cycle has covered seven stages with responsibility divided between the Air Research and Development Command, the Air Materiel Command, and the using commands. The ARDC was assigned responsibility for four stages: basic research, applied research, advanced development, and system research, development, test and engineering. The system production responsibility went to the AMC, and the using commands were in charge of the operational use and obsolescence phases (*See Chart 2*).

In practice, the office in the field which managed the system project would utilize personnel from ARDC, AMC, the using command (Strategic Air, Tactical Air, Air Defense, Military Air Transport Service), the Air Training Command, or other agencies such as the Army Engineers, NASA, and the Federal Aviation Agency.

This was true for ballistic missile systems, aeronautical systems (X-15, Dyna Soar), and electronic systems. Management responsibility passed from one command to another at specific times. Just as the using command was interested in the project from its initiation as a system effort, so the ARDC retained interest in the system until obsolescence. Modification, retrofit, and product improvement usually required R&D participation.

The seven-stage cycle will continue in the new organization, but again responsibilities have been reallocated —this time in drastic fashion.

The former Air Force Research Division of the ARDC has been redesignated the Office of Aerospace Research. It will absorb the Air Force Office of Scientific Research plus the Aeronautical Research Laboratory at Wright-Patterson AFB, and the Cambridge Research Laboratory at Hanscom AFB. Basic research and a part of applied research will be the responsibility of the new OAR.

The New Stages

The new Systems Command will regulate applied research, advanced development, system research, development, test and engineering, and system production. The using commands remain responsible for operational use and obsolescence (*See Chart 3*).

Prior to the reorganization, the Air Materiel Command maintained nine Air Materiel Areas, two Air Force Depots, three Contract Management Regions, and two Air Materiel Forces. In addition, it operated three Centers adjacent to three ARDC Divisions. These were the Ballistic Missile Center, adjacent to the ARDC's Ballistic Missile Division at Inglewood, Calif.; the Aeronautic Systems Center, next door to the ARDC's Wright Air Development Division at Wright-Patterson AFB; and the Electronics Systems Center, adjoining the ARDC's Com-

mand and Control Development Division at Hanscom AFB.

The ARDC, in addition to operating the three divisions named above, was the parent command of the Air Force Research Division; the Air Force Missile Test Center, Patrick AFB, Fla.; the Air Force Missile Development Center, Holloman AFB, N. Mex.; the Air Proving Ground Center, Eglin AFB, Fla.; the Arnold Engineering Development Center, Tullahoma, Tenn.; the Air Force Flight Test Center, Edwards AFB, Calif.; the Air Force Special Weapons Center, Kirtland AFB, N. Mex., and the Rome (N.Y.) Air Development Center (*See Chart 4*).

After Reorganization

When the reorganization is completed, the new Air Force Logistics Command will have jurisdiction over the nine Air Materiel Areas, the two Air Force Depots, and the two Air Materiel Forces formerly operated by AMC.

The nine Air Materiel Areas are Warner Robins, Robins AFB, Ga.; Rome, Griffiss AFB, N.Y.; San Bernardino, Norton AFB, Calif.; San Antonio, Kelly AFB, Texas; Oklahoma City, Tinker AFB, Okla.; Ogden, Hill AFB, Utah; Mobile, Brookley AFB, Ala., and Middletown, Olmsted AFB, Penna. The two Air Force Depots are Dayton, Gentile AF Station, Ohio, and Shelby, Wilkins AF Station, Ohio. The two Air Materiel Forces are Pacific Area, Wheeler AFB, Hawaii, and European Area, Chateauroux, France.

The new Air Force Systems Command will have four divisions: the Ballistic Systems Division, composed of elements of the AMC Ballistic Missile Center and the ARDC Ballistic Missile Division, and the Ballistic Missile Office of the Army's Corps of Engineers; the Space Systems Division, also composed of elements of the AMC Ballistic Missile Center and the ARDC Ballistic Missile Division; the Aeronautics Systems Division, composed of the AMC Aeronautical Systems Center and the ARDC Wright Air Development Division; and the Electronics Systems Division, made up of the AMC Electronic Systems Center and the ARDC Command and Control Division.

The new Systems Command will also take over all seven of the test and development centers previously operated by ARDC, and the three Contract Management Regions formerly under AMC (*See Chart 5*).

The Contract Management Regions are Eastern, Olmsted AFB, Penna.; Central, Wright-Patterson AFB, Ohio, and Western, Mira Loma AF Station, Calif.

The outstanding innovation included in the reorganiation is the assignment to the Systems Command of responsibility for all activities from applied research up to and including system production—the operation which formerly was run by the Air Materiel Command. It was no secret in the Air Force that decisions in the system production area were not always unanimous especially where contracts were involved. Henceforth, with single command responsibility, it is expected that these difficulties will vanish.

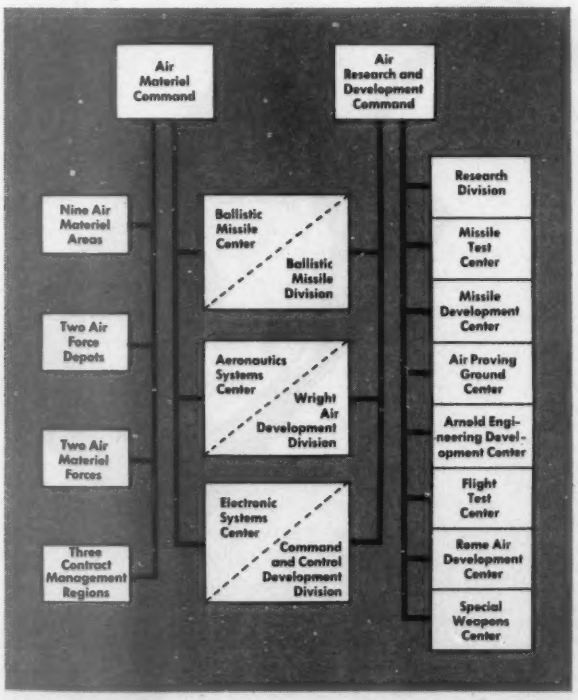
Army In Division

Another innovation is the establishment of the Army Engineers' Ballistic Missile Office as a part of the Air Force Ballistic Systems Division. Thus, Brig. Gen. A. C. Welling, USA, becomes Deputy for Site Activation to Maj. Gen. Thomas P. Gerrity, USAF, commander of the Air Force BSD.

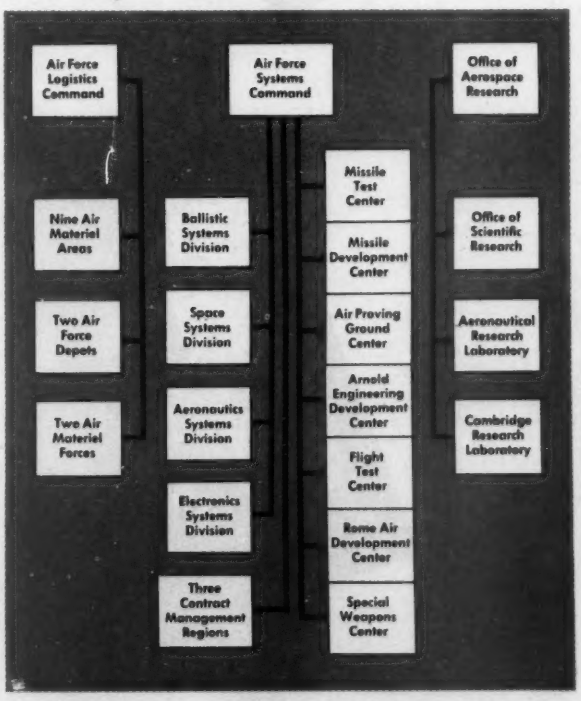
Establishment of the new Space Systems Division as one of the four within the Systems Command led to a third innovation. Various agencies such as the Army, Navy and NASA will have resident representatives within SSD Headquarters at Inglewood commanded by Maj. Gen. Osmond J. Ritland.

At both SSD and BSD, personnel from the using commands will participate in activities as was the former practice at BMD and BMC. The Air Force Logistics Command will provide support for the systems department just as the Air Training Command did in the past and will continue to do. The two divisions are under the command of Maj. Gen. Howell M. Estes, Deputy Commander for Aerospace Systems. ■

The Way It Was . . . *(Chart 4)*



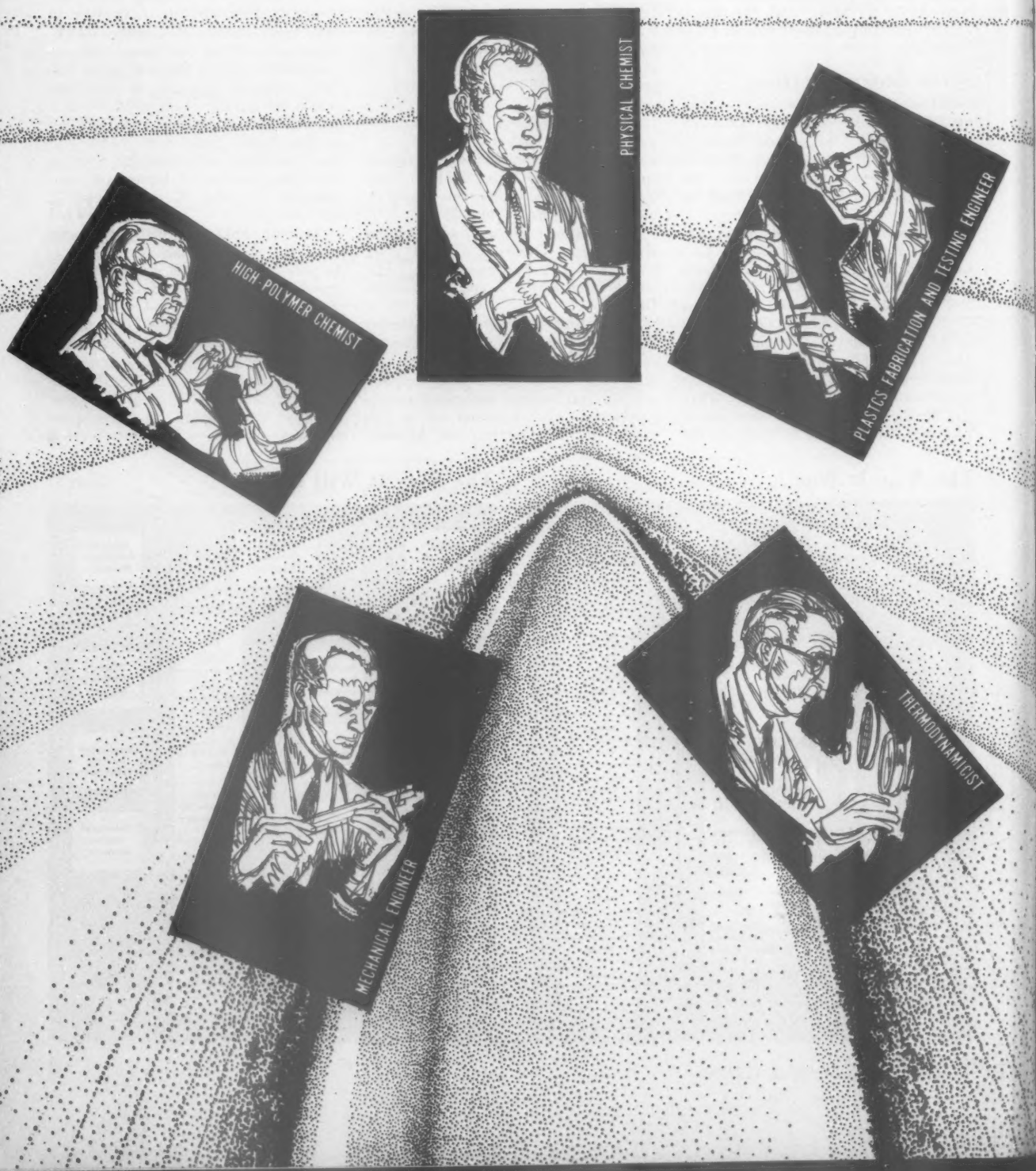
The Way It Will Be . . . *(Chart 5)*



Monsanto

Space-Age Project "HEAT FOIL"

A CHEMICAL EXPEDITION...



...searching for plastics materials that can "take" temperatures of 20,000° F. plus

Monsanto has developed high-heat-resistant resins for laminates that remain intact for upwards of 2-3 minutes at temperatures as high as 20,000° F.; that maintain integrity for 200 hours at 600° F. Under evaluation are plastics laminates that hold promise for rocket nose cones, nozzles, and other components exposed to high heat.

By applying basic knowledge of polymer chemistry to the problem of service life under heat, Monsanto is making new breakthroughs on the problem of high-heat resistance with plastics. One of the most promising plastics now being evaluated is a silane-modified phenol-formaldehyde resin which makes laminates and moldings that retain integrity after hundreds of hours of exposure to temperatures of 500-600° F. Still other polymers under development hold promise of broadening temperature resistance for increasing lengths of time.

MOLECULAR DISSOCIATION SETS UP COOLING ACTION

Some resins under study form a char layer which insulates the interior and reradiates a large portion of frictional energy. Plastics laminates made from such resins provide insulating walls for interior surfaces or areas.

HEAT RESISTANCE—PLUS STRENGTH AND LIGHT WEIGHT

As in many other fields, laboratory tests for space-vehicle science are hard to correlate with actual field performance. In standard Oxyacetylene Tests and Stabilized-Arc Tests, heat-resistant plastics laminates show adequate retention of structural integrity under high-heat stress.

Like other, more common reinforced plastics, the new heat-resistant laminates have exceptional mechanical strength. The following table indicates some of the mechanical properties obtained with a ⅛" section of a laminate made with a Monsanto silane-modified phenol-formaldehyde resin.

Property	Results	MIL-R-9299 Specifications
Flexural Flatwise		
Standard Condition 75° F.	73,800 psi	50,000
30-Day Water Immersion	73,400 psi	45,000
½ hr. @ 500° F.	62,900 psi	40,000
100 hrs. @ 500° F.	57,600 psi	20,000
200 hrs. @ 600° F.	22,600 psi	No Spec.
Modulus of Elasticity		
Standard Condition 75° F.	3.72×10^4	3.0×10^4
30-Day Water Immersion	3.65×10^4	3.65×10^4
100 hrs. @ 500° F.	3.28×10^4	2.5×10^4
200 hrs. @ 600° F.	1.48×10^4	No Spec.
Tensile Strength		
Standard Condition 75° F.	45,600 psi	40,000
30-Day Water Immersion	45,400 psi	38,000
100 hrs. @ 600° F.	23,100 psi	No Spec.
Edgewise Compression		
Standard Condition 75° F.	50,800 psi	35,000
30-Day Water Immersion	42,000 psi	30,000
100 hrs. @ 600° F.	8,240 psi	No Spec.
Barcol Hardness	76	55
Flammability	Self-extinguishing	1.0 max.

Mechanical Properties of Resinox® SC-1013 Laminates. (⅛" section; E.C.D. 225-181 glass cloth; 12 ply; 200-psi pressure cured 1 hr. at 250° F.; post cured in gradients of 50° F./24 hrs. each to 500° F.; resin content 29%) (Tests carried out as specified by MIL-R-9299)

COMMERCIAL PROMISE, TOO!

In addition to the properties described, the plastics laminates created for high-heat resistance are practically immune to fuels, oils, and solvents.

(Please turn page)

OUTSTANDING ELECTRICAL PROPERTIES

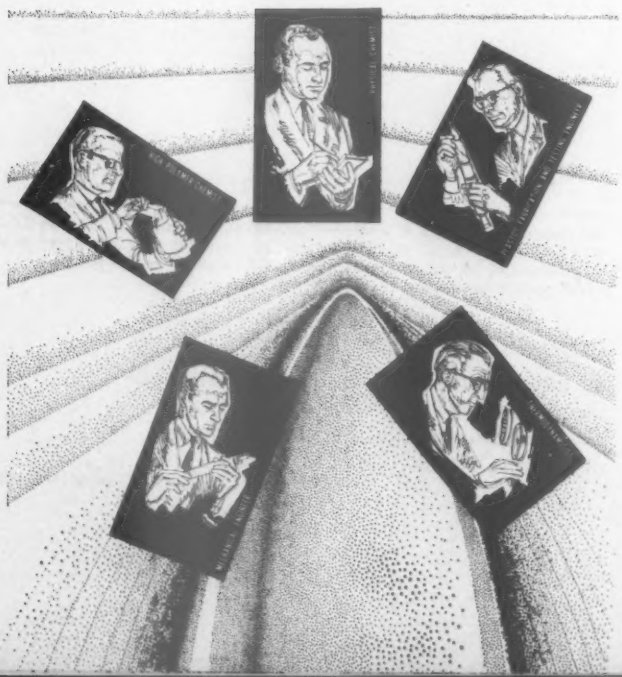
Heat-resistant plastics laminates have also shown outstanding performance in electronic applications wherever frequent cycles of heat and cold are a problem. While maintaining mechanical strength, plastics laminates (as described) showed no degradation of dielectric constant or loss tangent. The following table shows results on a typical panel after various numbers of cycles of heating for one hour at 550° F., then cooling ¼ hour to room temperature.

ELECTRICAL PROPERTIES AFTER CYCLING
(Approximately 9 KMC Resonant Cavity)

	Room-Temperature Electrical Properties	
No. of Cycles (1 hr. at 550° F.; ¼ hr. to 77° F.)	Dielectric Constant	Loss Tangent
0	4.8007	0.0217
100	4.7289	0.0218
150	4.7347	0.0218
200	4.7218	0.0214

OPTIMUM PARTS PERFORMANCE

In fabricating parts for optimum performance under high-heat conditions—fibrous glass, asbestos, or nylon is impregnated with resin, is molded, filament-wound or laminated by any of several methods, then cured.



THE CONTINUING SEARCH

Project "Heat Foil" is a continuing study of resins for high-heat resistance and of resins whose energy of dissociation makes them outstanding for high-temperature applications. This search will continue to develop materials that will help answer the high-heat requirements of a space age, in defense and industry. MONSANTO CHEMICAL COMPANY, Department AM-3, C Building, St. Louis 66, Missouri.

Monsanto Space-Age Projects for Government and Industry

* High-Temperature Hydraulic Fluids
* Coolant-Dielectrics for Electronic Equipment
* High-Temperature Plastics
* Improved Nitrogen Oxidizers for Solid Propellants
* Fire-Resistant Structural Plastics
* Hydrocarbon Fuels for Jets and Missiles
* Fire-Resistant Hydraulic Fluids for Ground-Support and Missile-Launching Equipment
* Radiation-Resistant Heat-Transfer Fluids
* High-Temperature Lubricants and Additives
* Radiation-Resistant Reactor Coolant-Moderators
* Intermetallic Semiconductor Materials
* Pure Silicon for Transistors, Rectifiers, Diodes
* Ultra-Fine Metal Oxides
* Materials for Vibration Damping
* Heat-Resistant Resins for Laminating and Bonding
* Inorganic Polymers
* High-Energy Solid Propellants

You are invited to work with Monsanto on your materials needs in the above fields.

Monsanto

Is Small Business
Getting a Raw Deal?

This question, resounding in the halls of Congress, has brought about increased emphasis on the small business program in Defense. As a result of an executive order to increase by 10% the dollar volume going to small business, the Services have gone all out to help the small man who already receives a third of every defense dollar.

by James Lewis

THE Small Business Act provides that economical assistance—through government originated contracts—be given small business concerns* in the interest of the over-all economy and defense effort of the United States. Department of Defense policy, as well as that of other government agencies, is to place a *fair proportion* of total purchases and contracts for supplies and services with small business concerns.

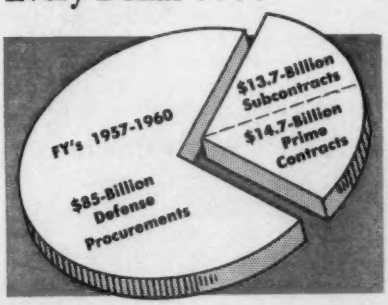
Congress, in its yearly endeaver to promote the small business cause (and insure that small business gets its fair share), has come up with what appears to be a legitimate complaint: the percentage of government funds (through defense prime contracts) going to small business concerns in FY 1960 dropped from 16.6% in FY 1959 to 16.1% and to an all time low for the past decade.

In an executive memorandum to Secretary of Defense McNamara, President Kennedy said, in part: "I note that Congress has once again criticized the Department of Defense for not giving more contracts to small business. This is an old complaint. I think it would be useful for you to have someone look into exactly how this is handled and whether it is possible for the Defense Department to put more emphasis on small business. If it isn't possible for us to do better than has been done in the past I think we should know about it. If it is possible for us to do better we should go ahead with it . . ."

As a result of this and subsequent DOD memorandums, wheels that seemed to be slowing down began to turn a little faster. Programs that had been matter-of-fact in the past were, and are now being, modified and accelerated to insure increased results.

Deputy Secretary of Defense Gilpatric, in a memorandum to the three Service secretaries, said, in part: ". . . you are directed to take such steps as are necessary to assure that small business firms will receive, in fiscal year 1962, prime contract awards (measured in dollars received as a percentage of total dollars) sufficient to constitute at least a 10 percent increase over the percentage received from your Department in fiscal year 1960. In implementing this instruction you will also take appropriate steps to insure that the downward trend reflected in the statistics for the first half of fiscal year 1961 is reversed before the end of this fiscal year."

One Third of Every Dollar . . . .



With 17.7% as their goal, (and a verbal mandate that if it doesn't increase, someone will have to stand-up and be counted), the three Services began looking in cracks and corners for new ways to channel money to small business—through both government prime contracts (which are awarded directly to small business by the government) and through a more vigorous small business subcontracting program (awarding contracts to small business by large businesses or the prime contractor).

The scope of the Defense small business program is wide and varied. The Military departments employ (either part or full time), 607 small business specialists at the different agencies of the Army, Navy and Air Force throughout the U.S. Reporting on each individual program would probably produce far more than a healthy tome. Here is a breakdown of the individual Services, including the Small Business Administration (SBA), their programs, and the steps being taken in their all-out effort to give small business a fairer share.

ARMY

Army (which placed 31.1% of total prime contract dollars with small business in FY 1960) probably has one of the most enthusiastic programs of the three Services. The program is centered around two points: (1) a campaign with the Army small business representatives in field installations, insuring increased emphasis on Army placement of contracts with small business, and (2) a vigorous effort to interest small business in Army contracting.

To attract small business, Army has set up a guidance program under the direction of Small Business Advisor Jack Askins. It encompasses almost everything from "How to Get Interested in Government Contracting" to "Whom to See if You Have a Problem in Getting a Contract." Askins bases his whole program on what he calls "Equitable Opportunity." According to him, an equitable opportunity to compete exists when the following conditions are met by the purchasing offices:

(1) When small business firms are afforded the opportunity of being placed on all bidders' mailing lists for which they are qualified.

(2) When small business firms are on bidders' mailing lists, they receive invitations for bids and/or requests for proposals.

(3) When bidders' lists are too large to go to all sources, and as a result the bidders' list is rotated, there is a pro rata share of small business firms included in those firms solicited.

(4) When the quantities are appropriate or partial bidding is permitted.

(5) When specifications and draw-

**Defined as a concern that (1) is not dominant in its field of operations and, with its affiliates, employs fewer than 500 employees; or (2) is certified as a small business concern by Small Business Administration.*

ings are adequate and clear.

(6) When drawings are available and understandable. In those isolated instances where drawings are not available the invitations for bids or requests for proposal state where drawings can be reviewed.

(7) When delivery schedules are realistic and reasonable.

(8) When sufficient time has been allowed for the preparation of a bid or proposal.

(9) When proposed procurements of $10,000 or more are publicized in the Department of Commerce Synopsis as prescribed in the Armed Services Procurement Regulation and Army Procurement Procedure 2-206.

Several proposed steps originating in the office of Lt. Gen. R. W. Colglazier, Jr., Deputy Chief of Staff (Logistics) have, and are being taken in Army field activities. One step: teams were sent to field activities to insure that the word was given individually to all procurement personnel and to each Army small business specialist. In addition to familiarizing each man with the present policies, this also serves as an insurance policy. When counting time comes, no one can say he didn't get the word.

Also set up by Army was the Industrial Assistance and Procurement Information Office. Its purpose: to help those interested in Army or government contracting. It receives copies of all formally advertised Invitations for Bids (IFB's) and abstracts of awards from Army and Air Force procurement activities. Copies of the IFB's and abstracts of awards are displayed for the convenience of those interested. IFB's on sales of surplus personal property from all selling activities of the Army, Navy and Air Force are also received and displayed there for interested parties.

AIR FORCE

The Air Force small business program, under the direction of Kennard Weddell, Assistant for Small Business to the Deputy Chief of Staff (Materiel), concentrates on a stronger small business organizational structure. Emphasis is placed on the Air Force-small business (as a prime contractor) relationship and the prime contractor-small business relationship. Air Force placed 9.0% of its total prime contract dollars with small business in FY 1960.

Air Force's small business program is composed of 70 full time small business specialists in specially assigned billets and 150 part time small business specialists. Part time specialists, in most cases, are base procurement officers responsible for base procurements only.

The Air Force small business subcontracting program is by far the most comprehensive of the three in that it encompasses a reporting system whereby it can be determined exactly how many small businesses were solicited for subcontracting by the prime contractor (or large business). Each large prime contractor and his larger subcontractors are requested to submit a check list and quarterly summary form showing the effort of the buyer to solicit small business concerns, the reasons why small business concerns were not solicited if that was the case, and the outcome of the procurement when they were solicited. This enables Air Force to keep a check on prime contractors, insuring that small business gets full opportunity to compete. (There are other check-lists, forms and the like which Air Force asks large companies to file although this is not covered by a contract clause, nor is it a set requirement).

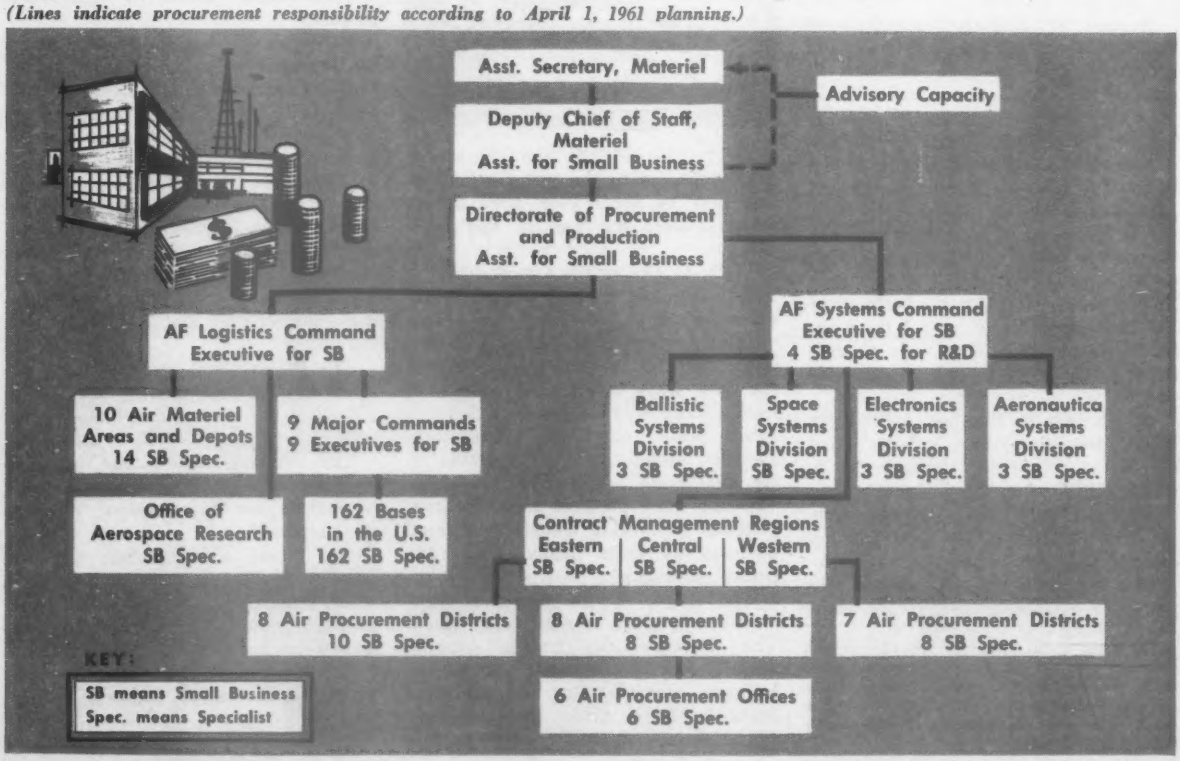
NAVY

Navy's Office of Small Business, headed by Captain M. J. Barkdull Kahao, serves as the policy and guidance hub for the Navy small business program. Each individual bureau (BuWeps, BuShips, etc.) contracts for those items within their jurisdiction. Each bureau is staffed with its own small business specialist. Contract terms are the responsibility of the Contracting Officer within the individual

(Continued on page 60)

Organizational Location of Air Force Small Business Specialists

(Lines indicate procurement responsibility according to April 1, 1961 planning.)



He solved this puzzle by taking it apart!

Like oil and water, extreme precision and "complete" mobility resist combination in tracking radar antennas. Designing for one of these characteristics "automatically" precludes the other. *That* was this AMF Engineer's puzzle—to put *both* precision *and* mobility in an antenna for duty with the Marine Corps.

He solved the puzzle, literally, by taking apart the solution—AMF's TPQ-10 antenna—into 10 rugged, portable, submersible, precision-fabricated packages. TPQ-10 is designed for helicopter transport. Each component can be dropped in water; it will come up for more. The packaged antenna on its pallet can be dropped on land from 3 feet without impairing precision.

Each component can be *picked* up—the largest weighs 425 lbs.—and can be handled by 3 men. A crew of 6 can put TPQ-10 together in 20 minutes with one standard wrench.

Among the design innovations that solved the puzzle is a "piggy-back" gear arrangement that puts both azimuth and elevation drives in one package. Result: almost half the parts and weight of separate components. Precision fabrication is typified by the reflector arms, held to a .005" deviation over 45 inches!

(For unclassified information on early warning and radar antenna systems, write Dept. CS 1, address below.)

Single Command Concept

Solving puzzles with next-to-impossible conditions is AMF's business. AMF's imagination and skills are organized in a single operational unit offering a wide range of engineering and production capabilities. It accepts assignments at any stage from concept through development, production and service training, and completes them faster... in

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- *Weapon Systems • Undersea Warfare*
- *Automatic Handling & Processing*
- *Range Instrumentation • Radar*
- *Space Environment Equipment*
- *Nuclear Research & Development*

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There are plenty of reasons why the Lockheed Hercules (GC-130) is an ideal father ship for target drones: speed, altitude, endurance; pressurized, air-conditioned work space for drone directors; high wing for good ground clearance and accessibility; short takeoff and landing. These same reasons, plus a lot of others, make the C-130 Hercules the free world's most versatile and useful cargo airplane.

The big propjet airlifter is now operating or being built in 12 different configurations. C-130s have flown more than a million miles since 1957—and they will fly millions more in years to come. Lockheed Aircraft Corporation, Marietta, Georgia.

LOCKHEED GEORGIA

AiResearch pressure suit cooling unit

provides maximum pilot comfort on the ground

This portable, lightweight package keeps the pilot cool and comfortable on the ground in his flight pressure suit from one to two hours. Utilizing cryogenic liquid oxygen as the coolant, it requires no electric power or other connecting supplies which might hinder the pilot's mobility.

Easily carried by hand or slung from the shoulder, the AiResearch unit can cool a pilot wearing either full or partial pressure suit during travel to and from his aircraft, preflight checkout and while seated in the cockpit. Pure oxygen for prebreathing can also be provided as a simultaneous function.

This extremely simple and reliable cooling unit has no moving parts. In operation, ambient air vaporizes a supply of liquid oxygen to pressurize the system. Cooling air, made up of stored oxygen and ambient air, is then circulated through the suit.

AiResearch is also in production on self-contained life support systems inside fully enclosed protective suits. These suits allow the wearer to work safely in hostile environments such as toxic missile fuel handling and fire fighting. Research for modification of these systems is now being conducted for space use.

• *Please direct inquiries to Los Angeles Division*

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Procurement Trends

Defense Weighs Joint Training

Under consideration in the Office of the Secretary of Defense is the establishment of a joint training program for procurement personnel of the military services. Procurement training by the individual services has produced excellent results for the service concerned, it is conceded. Proponents of the joint training program, however, contend that the plan will bring about improvements by setting up uniform standards and procedures in conformity with current Defense doctrines.

Industry Uses More Brains

Non-production workers now represent more than 40 percent of total employment in the aircraft and parts industry, and the proportion is growing constantly. At the peak of aircraft and parts activities during the Korean War, slightly more than 25 percent of the workers were classed as non-production. Defense Department explanation: growing importance of R, D, T&E work in comparison with straight production; growing requirements for scientists, engineers and overhead personnel, and advances in technology.

Sales Soar In Electronics

Military electronics equipment sales have almost doubled since 1955 and now represent about one half of the total factory sales of the electronics and communications equipment industries. For the ten-year period from 1950, sales in this area mounted from approximately one-half billion dollars annually to about $5 billion.

Defense Boosts Gun Output

Operations in the ordnance accessories industry are on a substantial upward trend which is expected to continue for the next few years. Increased Defense procurement of conventional weapons and equipment is the underlying factor, buttressed by Defense programs for FY 1961 and 1962 emphasizing weapons systems utilizing non-nuclear ammunition.

Aircraft Down, Missiles Up

Planned obligations by the Defense Department for aircraft and missiles through FY 1962 indicate continuation of decreased employment in the aircraft industry and increased employment in missiles. Since 1957, Defense expenditures for aircraft have declined about 25 percent and aircraft employment has gone down at about the same rate. Over the same period, Defense spending on missiles has about doubled and missile employment in all industries has increased by 70 percent.

Navy Doubles Shipbuilding

Navy expenditures for shipbuilding have doubled since 1957 but shipyard employment on Navy work has increased only slightly. The answer to this discrepancy is the rapidly increasing proportion of Defense shipbuilding funds spent outside the shipyard for Navy electronics, armaments and power plants. Item: the power plant in a nuclear-powered submarine represents a much greater proportion of total ship costs than in a conventionally powered submarine.

Foolproof Labels Still Sought

Military supply officers long have known that proper, accurate, and indestructible labelling of supplies and hardware in the field constitutes a monumental headache. Pasted-on paper labels tear off boxes, stencilled paintings erode away, hand-written labelling becomes illegible. The latest story on this subject is that a West Coast manufacturer had a fool-proof system for solving the problem. Lyle Garlock sent one of his Air Force generals to investigate. The general was so enthused that he directed the Air Materiel Command to go to work on the system "immediately." Story concludes: "That was three years ago and we are *still* waiting."

Procurement Trends

AF Gives Congress Equipment Buy Details

Air Force is asking Congress for $128.9-million for an additional 144 T-38 trainers and $50.3-million for 55 T-39 trainers. A total of 213 T-38s has been funded through FY 1961 and Air Force has a requirement for a total of 740 planes, according to Deputy Director of Operations, Maj. Gen. John K. Hester.

In detailing authorization requests in the FY 1962 budget, Hester also said some additional T-39s will be requested in subsequent years. He said 94 are funded through FY 1961.

Hester said FY 1962 funds are sought to purchase three types of rockets, the GAR-3A, carried by the F-106; the GAR-4A, an infrared target seeker; and the GAR-11, a nuclear air-to-air missile with a radar seeker guidance system which will be carried by the F-102.

He said funds will be applied to buy long leadtime components to support eventual purchase of the RF-105, reconnaissance version of the F-105 and the RC-130, a C-130 transport specially configured and equipped for air photo and charting service.

Other planned Air Force procurements, of which no numbers were given, include: KC-135 tankers; F-105s; T-40s; C-130s (this has been previously detailed); continued purchase of Atlas missiles and buy of installation and checkout equipment; purchase of Titan I missiles and ground operational, installation and checkout equipment and continued procurement of ground equipment for Titan II; incremental funding for Minuteman ground support equipment. Funds are also asked for Hound Dog, Bullpup and $218-million for the B-70.

Army Materiel Command Hosts Midwestern Firms

Business, particularly small business, gave a graphic demonstration last month that it was eager to participate in Government procurement. Its interest was greatly accentuated by the assurance that at least some of the red tape (traditionally attached to the process) would be eliminated.

The occasion was a unique "Procurement Fair," held for the first time by the Transportation Materiel Command at its St. Louis headquarters in the Mart Building.

Approximately 400 representatives of business firms from widely separated areas of the midwest attended.

On view, and the center of critical attention, were samples of 106 procurement items for which the Transportation Materiel Command has immediate supply requirements—all of which have been made open to competitive bidding for the first time.

It was—taken by and large—a "brass tack" affair. Business was there to see specifically what Army wanted, how it wanted it made, and in what quantities. Army representatives, equally ready to do business, were on hand to supply drawings and specifications and other technical data—and to accept bids.

Before TMC's initial "Procurement Fair" ended, bids already had been submitted from approximately 50 suppliers.

Aside from its own interest in expediting procurement of needed items, the Army had another equally important objective: to relieve unemployment in labor surplus areas.

Defense Spending Seen As Economy Boost

Anticipated Defense Department obligations of $8.5-billion, with resulting new order in the final quarter of this fiscal year, should play a "highly significant" part in the nation's economic recovery, Pentagon Comptroller Charles J. Hitch told Congress recently.

Testifying before the Joint Economic Committee, Hitch said the $8.5-billion rate represents a considerable increase of obligations over the April-to-June quarter of the past two years. He said, however, that the same rate obviously would not continue through fiscal year 1962. "Allowing for the usual seasonal pattern we estimate that perhaps $9-$10-billion will be obligated in the first half of the fiscal year, and $12-$13-billion in the second half."

Obligations for procurement, research and development and construction are expected to increase to about $23.75-billion in 1961—the highest level of any year since 1952.

Procurement obligations of over $15-billion are planned for FY 1962—nearly $1-billion less than the current fiscal year, but $2.5-billion more than FY 1960.

Procurement of equipment and materiel other than aircraft, missiles and ships will total over $3-billion in FY 1962—up some $300-million over the current year and $700-million over 1960.

Obligations for research, development, test and evaluation will continue an upward trend, reaching a total of about $4.75-billion in FY 1962, paralleling the current fiscal year but some $750-million more than 1960.

The substantial increase in planned obligations during this fiscal year will affect expenditures for several years ahead. "Based on the revised budget estimate," Hitch said, "expenditures during the current fiscal year are estimated at $42.5-billion, $1.25-billion more than in FY 1960, and we expect them to rise another $1.25-billion to $43.8-billion in FY 1962."

Business Opportunities Offered at GE Meeting

Some $300-million in business opportunities were offered by General Electric last month to small manufacturers in the Chicago area and in eight midwestern states.

More than 1500 small business representatives attended the one day meeting in which specific information was presented on the 1961 subcontract opportunities available with the firm's Flight Propulsion Division. The division will let $300-million in subcontracts in 1961.

The Chicago procurement symposium was the largest industry-sponsored meeting of its kind since GE pioneered the idea two years ago in cooperation with the Small Business Administration.

According to R. J. McElligott, Small Business Administrator for the division's Large Jet Engine Department, every firm requesting consideration and registering with the division as a potential supplier was given a competitive opportunity to quote within two weeks.

During the past year, General Electric has purchased more than $1-billion worth of goods and services from small businesses like those that were represented at the Chicago meeting.

Defense Tightens Patent Policy

Defense Department, in a recent revision of the Armed Service Procurement Regulation, has tightened its patent policy. In a letter to House Space Committee Chairman Overton Brooks (D-La.), explaining the revision, Deputy Assistant Secretary of Defense (Installations and Logistics) G. C. Bannerman, said DOD now recognizes some cases in which the Pentagon should take title to inventions developed under government contracts.

Pentagon practice generally has been to obtain merely royalty-free licenses for the use of inventions, leaving the commercial rights to the developer.

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Standard variations of the basic Versatrac vehicle include an amphibious personnel carrier — adaptable as radio or command vehicle, cargo vehicle or tracked van; a self propelled 105 mm howitzer carriage, 318 mm rocket launcher, bulldozer, trencher, forklift and auger.

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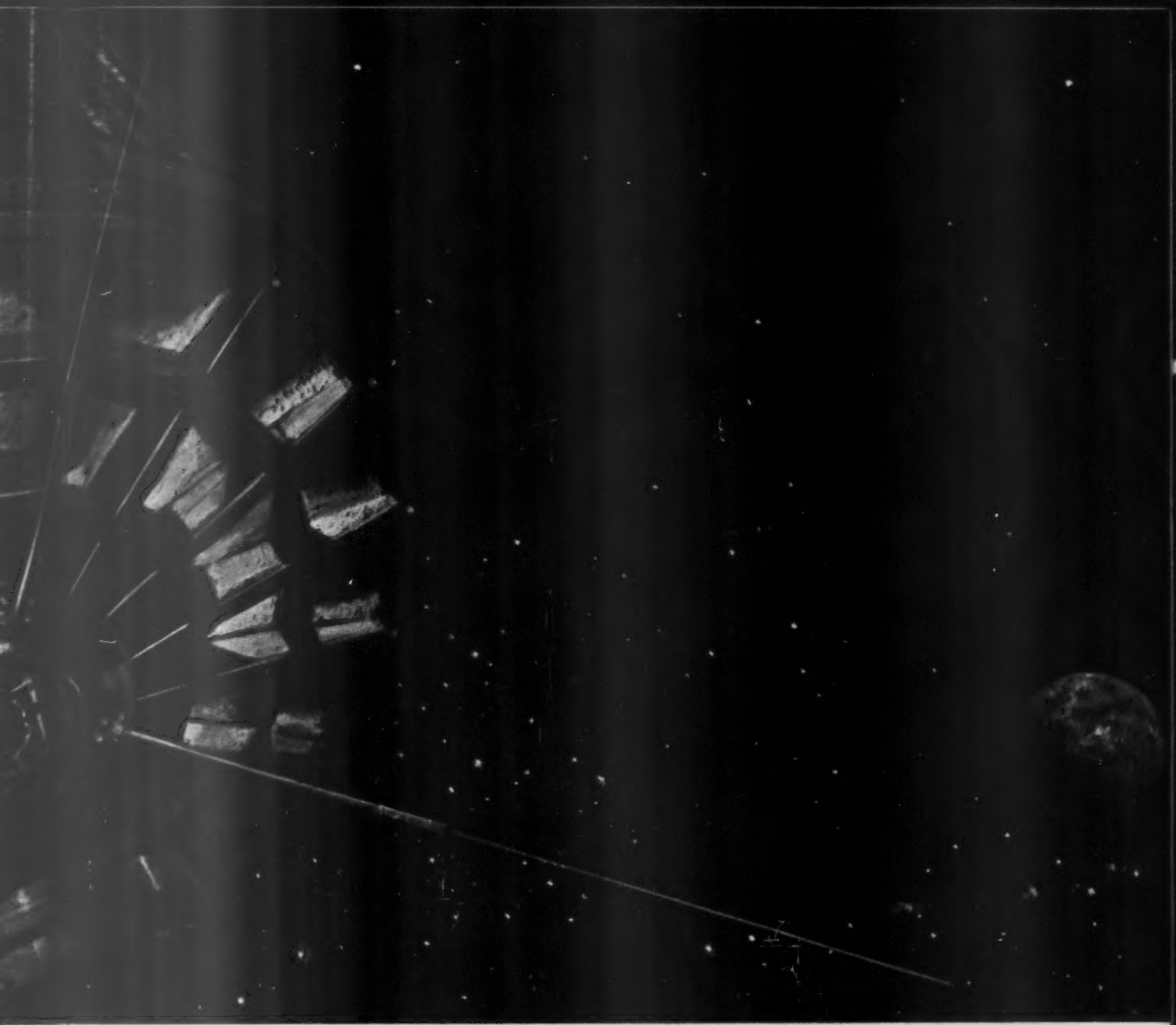
RCA-NASA Development of TIROS Advances Progress in Worldwide Weather Forecasting

From its vantage point in space, TIROS is sending down to earth new, more definite pictures and data of the world's everchanging weather patterns to aid man in his ageless efforts to control the elements.

Incorporating revolutionary and advanced electronic equipment, TIROS was designed, developed and built by RCA's Astro-Electronics Division for National Aeronautics and Space Administration. Within its small circumference are miniature TV cameras, tape recorders, TV transmitters, command receivers, timing mechanisms, beacons and telemetry equipment. In addition, it carries new scanning and non-scanning Infra-red Sensing Devices, developed by NASA, to measure and record the heat radiation of the earth and its cloud cover, and a revolutionary new Magnetic Orientation Device to capitalize on the effects of the earth's magnetic field and maintain favorable orientation of the satellite for long periods.



BMEWS—RCA Electronics Equipment and Systems contribute to the alert status of the Nation's vast outer perimeter early warning system.

DAMP—at the Caribbean down-range missile testing "slot," the highly complex DAMP vessel is equipped with RCA electronic tracking devices.

ATLAS—an RCA-developed checkout and launch system reduces substantially the "countdown" period required for launching this missile.

RCA developments in miniaturization, reliability, computing and overall electronic activities are contributing to many of the nation's leading space and missile projects. For information describing new RCA scientific developments, write Dept. 434, **Defense Electronic Products,** Radio Corporation of America, Camden, N.J.

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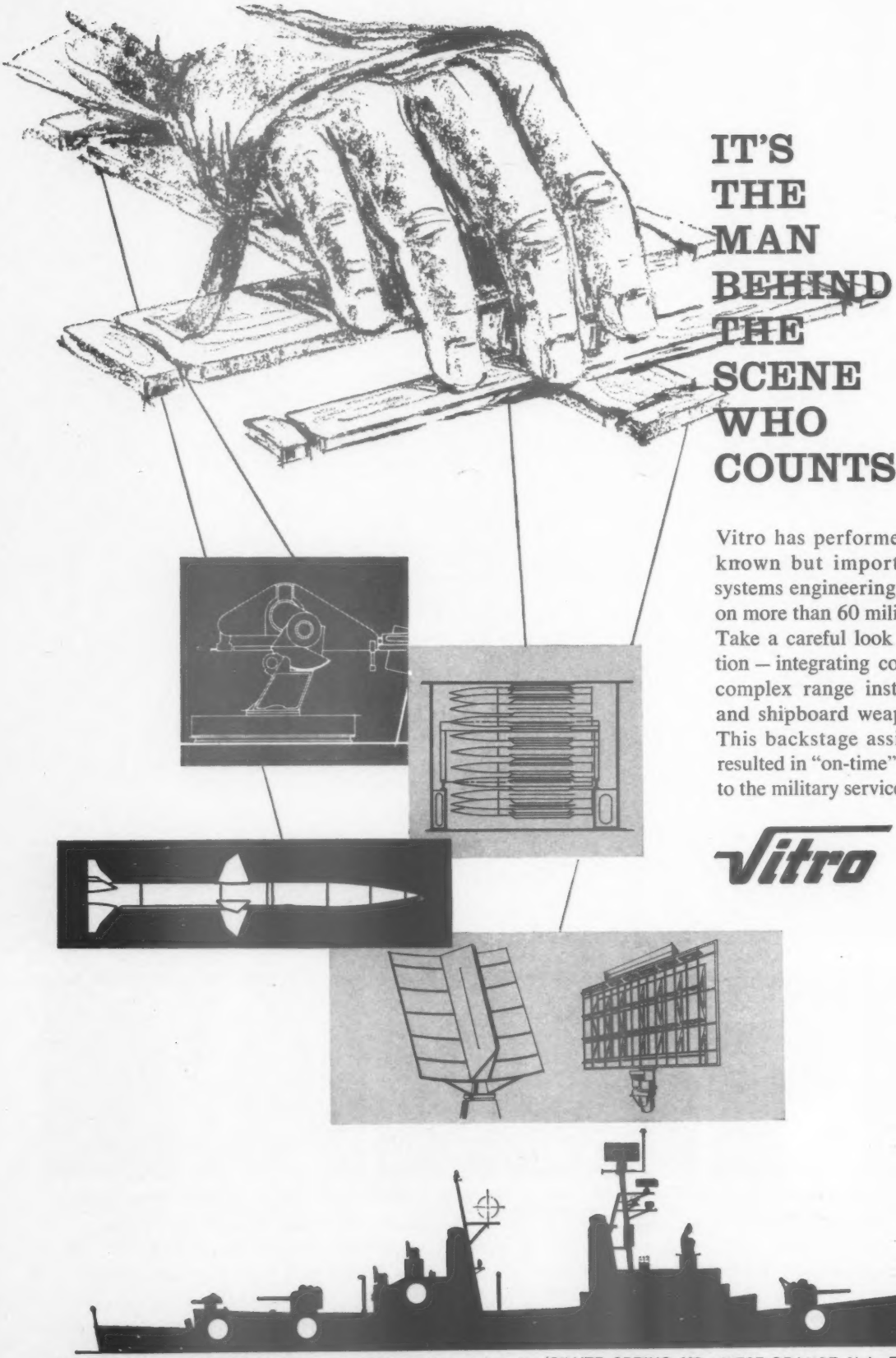

IT'S THE MAN BEHIND THE SCENE WHO COUNTS

Vitro has performed the little-known but important role of systems engineering coordinator on more than 60 military systems. Take a careful look at this function – integrating components of complex range instrumentation and shipboard weapon systems. This backstage assignment has resulted in "on-time" performance to the military services.

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Hands off Defense Patent Policy!

Proposals to give Government the patent rights for inventions derived from Defense contracts raise questions of constitutionality. Criticism is levelled also at patent and procurement procedures in other Federal agencies; caution urged in weighing changes.

by Denham S. Scott

Both within and without the Defense Department, debate is brisk on current proposals to extend to Defense contracts the existing policy in other Federal agencies which gives the Government title to patents. Mr. Scott, who is assistant to J. C. Garrett, president of the Garrett Corporation, Los Angeles, Calif., is one of the most outspoken critics of the existing policy and has been studying the problem of proprietary and patent rights for a number of years. He first aired his convictions on the patent question and on "unfair" Government procurement policies a year ago as a witness before the Select Committee on Small Business of the House of Representatives. Later, he amplified his views on these subjects in the Garrett Corporation's house organ, "New Frontiers."

Just a minute, Senator! Misguided forces within our government have been at work for years, whittling and chipping away at one of the cornerstones of our free enterprise system. They have already led us to the brink of a toboggan slide. The question is, Senator, shall we take the ride? Here is the ground we now stand on—at the brink:

1. Our free enterprise system is being seriously challenged.

2. Our patent system has been altered (Atomic Energy Commission, National Aeronautics and Space Administration and Federal Aviation Agency have been set up in contradiction to it).

3. The proprietary (property) rights of our defense contractors in their manufacturing drawings are being routinely ignored and confiscated by the government every day.

All of this is being done indiscriminately and without payment or compensation for the legal property of the American citizens upon whom we must depend for survival.

Before deciding whether to take the hazardous ride, we should retrace and contemplate the steps of our journey. Let us go way back to the beginning, by examining our birth certificate, the Constitution of the United States:

> *"Congress shall have the power to promote the progress of science and the useful arts, by securing for limited times to authors and inventors the exclusive rights to their respective writings and discoveries." Article I, Section 8, paragraph 8.*

The above words from our founding fathers express the philosophy upon which the laws that govern our free enterprise system are founded. This system has been proven to be so dynamic that under it the then-infant nation steadily progressed and, within a relatively short span, became the freest, richest and most powerful nation in the world.

Today, it is the main bulwark of the peoples of the free world against the serfdoms of communism and socialism. The system has endured the trials of 171 years. It has served us well. We presume, therefore, Senator, that we agree that this philosophy and these laws should not be changed unless a soul searching and penetrating analysis has *proven* the fact that this portion of the United States Constitution has become obsolete.

Yet, in 1947 the then-attorney general (the Hon. Thomas Clarke) submitted an official report to the President of the United States in which he recommended as follows: "As a basic policy all contracts for research and development work financed with federal funds should contain a stipulation providing that the government should be entitled to all rights to inventions produced in the performance of the contract." Obviously, the attorney general was using his high office to voice a significant departure from the incentive to the inventive philosophy of the Constitution.

Today, there are some serious minded and conscientious public officials, including some senators and representatives, who agree with Thomas Clarke and are disposed to believe that the time has some to change the laws. They have seemingly plausible arguments. They know that in our desperate need to maintain technological supremacy, Congress is annually appropriating many billions of taxpayers' dollars for all kinds of research and development defense and space projects. They know that this is an era of incredibly rapid technological progress in which fantastic break-throughs are commonplace.

As custodian of the public purse, Congress regards it as its sacred duty to obtain for the government everything that the taxpayers have paid for, which they presume includes titles to patents on inventions and proprietary rights to all that industry develops at government expense. They are properly both suspicious and fearful of possible monopolies operating in restraint of free trade, and they believe that we are witnessing an ever-increasing concentration of economic power into the hands of a few giants.

Some congressmen associate these undesirable manifestations with the operation of the patent system and they are resolved that, in spite of it, the

Patents May Go To U.S.

Proposals to vest in the Government title to all patents on inventions resulting from research contracts with the Defense Department are now under consideration in Congress.

The proposals were spelled out in a report by the Senate Subcommittee on Patents, Trademarks, and Copyrights.

"Patents obtained or processes developed as a by-product of public funds appropriated for general research should be reserved for public use," the report stated. "They should not be given as unearned bonuses from the U.S. Treasury to research contractors whose efforts have been made possible by general congressional appropriations without any legislative provision for a patent policy.

"Thus by executive action alone, without the approval of Congress or for that matter by review of the Bureau of the Budget, the Defense Department has established a policy which allows commercially valuable patents to be obtained by research contractors who have already been paid for their work by the billions of dollars appropriated for research and who are not necessarily the authors or inventors whose writings and discoveries are the subject of the limited monopolies granted by Congress under paragraph 8 of section 8 of Article I of the Constitution of the United States."

The report emphasized that by statute the Atomic Energy Commission and the National Aeronautics and Space Administration follow the policy of vesting title to such inventions in the Government so that they become equally available to all commercial users. A similar policy is followed by the Departments of Agriculture and Interior.

"The Defense Department patent policy," the report charged, "is deliberately intended to authorize the precise exclusive exploitation of such inventions that Congress has directed the civilian agencies to prevent.

"Total Government expenditures for research have now reached the point where they represent most of the funds, public and private, spent for scientific research in the United States. The Congress should not continue to vote enormous defense appropriations for scientific research without assuming responsibility for disposition of the resulting inventions.

"This report proposes that, pending the enactment of general legislative standards, the Defense Department should, by appropriate administrative regulations, conform its patent policy to that of the civilian research agencies in all of their common fields of scientific exploration."

very large sums of tax dollars which must be spent with industry shall be disbursed in such an equitable manner as to bring maximum benefits to the broad base of the nation's industrial complex.

They know that they have passed laws which decree that government contracts should be awarded to the lowest responsible bidder in open competition. They are disturbed that the military departments do not appear to be following this intent, but rather seem to spend the bulk of their appropriations by negotiating with selected defense contractors. They know that they have created a Small Business Administration and have passed laws designed to secure a fair share of this federal spending for small business; and they are convinced, and the available statistics seem to prove, that these plans and objectives have hit some kind of barriers.

One can understand why numerous senators and representatives have cast critical eyes upon these seeming facts and the supporting statistics, and have concluded that somewhere or somehow the laws which they enacted have failed to secure a fair proportion of Department of Defense dollars for the small business community. Furthermore it *is* the proper function of our law makers to concern themselves with these problems of our national economy.

Certainly, other articles and sections of our Constitution have been re-examined and amended as times and changing conditions have warranted. Therefore, Article I, Section 8, is certainly not to be considered immune to reappraisal. However, because it is a cornerstone of the foundation upon which our free enterprise system has been built, such reappraisal should be approached with great wisdom and caution. Let us not be unmindful of the lesson contained in Aesop's fable in which the farmer killed the goose that laid the golden eggs. Let us also remember the sage who pointed out the futility of trying to squeeze blood out of a turnip.

Senator, we must immediately stop the present nonsense where, at every session of Congress, eager sponsors try to railroad through a curious assortment of bills which approach the problem in a piecemeal, fragmentary manner. They have already brought about a situation of very considerable confusion and obvious inconsistencies. For instance, each and every one of the different agencies within the federal government contracts with industry in accordance with different laws, regulations or rules, the most glaring example being, of course, the difference between the National Aeronautics and Space Administration and the Department of Defense.

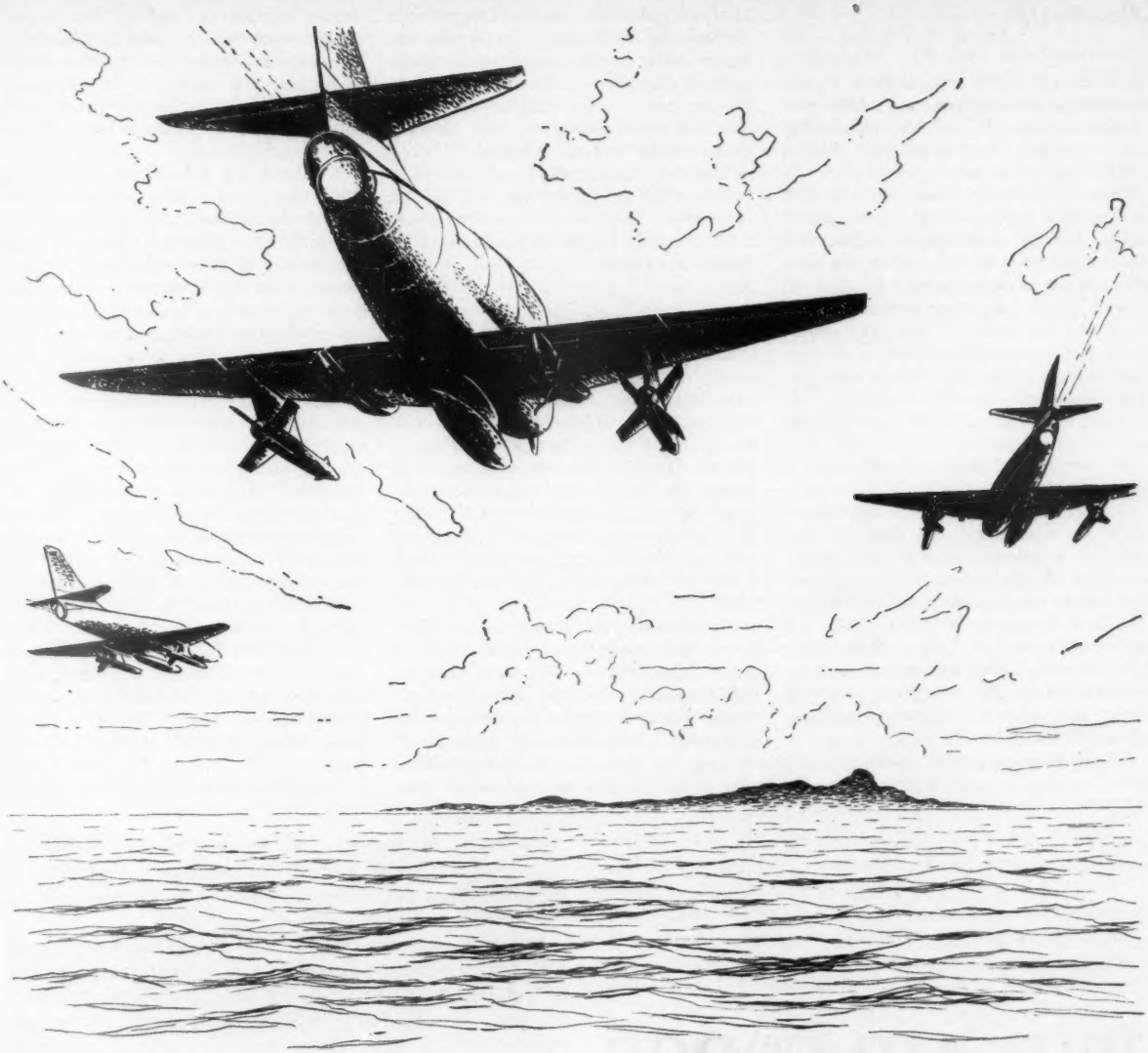
Here we have two agencies of the same federal government, each contracting with the same contractors for similar commodities, but each using widely divergent patent policies.

The Department of Defense, on the basis of much broader experience in contract administration than any other government department or agency, has long since concluded that the public interest is best served by *not* taking, as a matter of general practice, full right, title and interest to inventions conceived or first reduced to practice under a defense contract. Instead, these military agencies have insisted only that the contractor grant to the government a royalty-free, nonexclusive license to practice, or have practiced, for government purposes such inventions.

The defense industry is content with this reasonably equitable arrangement; whereas, the same industry in 1958 suddenly found itself confronted with Section 305 of the National Aeronautics and Space Act which certain zealous politicians hastily enacted without hearings or adequate consideration. In essence, the Space Act provides that the contractor and his *subcontractors* will deed titles to the government of all patentable inventions discovered in connection with the performance of NASA contracts.

Industry is disenchanted with the whole idea. Industry is also positively

(Continued on page 38)



NAVIGATION OF TACTICAL AIRCRAFT

To reach the target — deliver the payload — and return home safely under all weather conditions are prime objectives of the tactical aircraft's mission. Required operating factors include speeds up to Mach 2, accurate navigation over land and water, from the deck to 70,000 feet, and greatest possible freedom from detection. Positive, low-level target identification and utmost accuracy of the weapon delivery maneuver are also essential.

LFE has developed Doppler Navigation Systems that are especially suited to tactical aircraft. They are operable within scramble time — function in winds up to hurricane velocity — are unaffected by cloud and rain back-scattering — have low power outputs — are virtually impossible to detect, jam or decoy — measure ground track velocity to better than 0.2% — and are completely compatible with nav-bomb and fire control computers.

These operational characteristics combined with lightest weight, minimum cubage, lowest power consumption, smallest antenna aperture, and adaptability to wing or fuselage mounting, establish LFE's Doppler Navigation Equipments as the ideal navigation systems for tactical aircraft.

Details on the characteristics of LFE's self-contained Airborne Doppler Navigation Systems are available in a series of LFE Technical Notes. Please address inquiries to Dept. PI-24.

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Systems, Equipment & Components for Airborne Navigation • Radar & Surveillance • Ground Support • Hydraulic Control
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Hands Off

(Continued from page 36)

disenchanted and disgruntled at the parliamentary maneuvering which produced Section 305 of the Space Act as a sudden "fait accompli," like a rabbit out of a hat.

The point being made here is that *if* we have a problem where inequities *seem* to be developing within the framework of our free enterprise system, then we must surely be able to isolate these inequities and prove that they *are* traceable to our free enterprise system. When we have done this, and if the proven facts justify changes, we surely are capable of openly and wisely determining how to legislate corrective measures.

Please, Senator, are you alive to this danger?

We in business advocate that there must be centralized, in specially appointed subcommittees of the Senate and the House Judiciary Committees, the whole responsibility to investigate, and that if serious shortcomings can be responsibly *proven*, they shall be publicly examined in a unified and comprehensive study by competent experts from government, industry, science, economics and law.

Congress is alarmed, because even after passing and amending laws and applying pressures on the Department of Defense, the percentage of the defense dollar being awarded to small business has now declined to less than 17 per cent. Individual senators and representatives jump at the conclusion that the will of Congress is being deliberately thwarted. They don't stop to ask what should the percentage be? Naturally, they don't wonder about such ordinary things as the amount of blood in turnips.

Policy Changes

Changes in policy have most definitely not come about by any desire emanating from within the procurement agencies themselves. On the contrary, most government contracting officers deplore the changes as being both undemocratic and dangerous from a reliability point of view. The pollution of critical supplies with ersatz parts is not conducive to perfect performance of missiles, rockets or aircraft.

No, Senator, the Department of Defense and the other federal agencies have reluctantly succumbed to infringements of the law, and more particularly to pressures from certain congressional committees and their handmaiden, the General Accounting Office who diligently polices the various procuring services to enforce the theory that the government paid for the rights to use, for competition reprocurement purposes, the millions of drawings which industry, large and small, submitted for the pittance cost of the paper and service.

I believe it is safe to say that during 1960 the director of procurement policy for the Department of Defense and his staff were forced to spend a high percentage of their valuable time preparing their defenses for, or attending, investigations and hearings, at most of which they and their procurement policies and practices were under fire, because (1) they were not using the formal advertising procedures often enough; (2) they were not obtaining enough competition; (3) they were not placing enough orders with small business; (4) they were not using the exclusive set-asides for small business sufficiently diligently; (5) they seemed afraid or reluctant to disregard the proprietary claims of their contractors.

The Department of Defense, being the big spender, has been the chief whipping boy; it is suspected of being too set in its ways, and of offering only insincere lip service instead of determined cooperation in the drive to get some dollars to small business—"Little Joe."

They are perhaps ready to accept

WHY AIR FORCE HAS ADOPTED MICROFILM FOR ENGINEERING DRAWINGS

Recently the Air Force issued new contract requirements that makes the use of microfilm mandatory for most engineering data and records relating to items delivered by contractors and their vendors.

The new requirements (MCP-71-77) incorporate standards and specifications issued earlier by the Department of Defense for its Engineering Data Micro-Reproduction System. The Air Force move is more proof of the importance of microfilm to the government in saving time, money and space.

Obviously, the Department of Defense and the Air Force are convinced that working with microfilm is easier than working with paper, that it is more efficient and costs less. In other words, the government has discovered that filmwork is easier and more practical than paperwork for engineering drawings and records.

This is not news to the many industries that use microfilm today. They know that microfilm is a highly efficient and effective production communication tool. They know that microfilm can do many jobs much faster and much more accurately, with almost fantastic savings in time and money.

3M makes microfilm easy to use

the idea that "Little Joe" should get his cut as a subcontractor to a prime contractor; but, they feel that big business cannot be trusted to voluntarily share the pie and that, therefore, they must find a way to make big business open the pantry door. They feel that the solution of the difficulty lies in the free use of the millions of contractors' drawings in government files; they believe that these have been bought and paid for; and that, since they are the result of government-financed research and development work, they are, therefore, legitimate government property.

The Costs

They fail to realize that private industry is also digging deep into private pockets in the competitive race for technological advances. They are confused, because they have been correctly informed that industry normally puts a price tag on the package of data which must be submitted in connection with contracts for hardware, and they believe that the government has thereby bought these drawings and all rights therein.

It is extremely costly to meet the government's requirement for delivering complete sets of drawings, processes, etc., which must meet the exacting requirements of the multiplicity of rigid specifications. Industry simply cannot afford to render this service gratis. One way or another, the government must pay for it; therefore, most contractors do indeed put a price tag on the data requirements, but these dollars are for the service and the paper (blueprints, EAM cards, microfilm, etc.). Most definitely, there is no intent on the part of the contractor to sell his manufacturing rights, neither does his data price include any dollars for them. Furthermore, there is not enough money in the United States Treasury to begin to pay for the privately developed know-how of industry.

Congress must learn to respect these fundamental facts: (1) Inventive industry is not in the business of designing products for others to build; (2) private industry guards its drawings and trade secrets very zealously, by the simple expedient of withholding them from the public domain; and (3) industry will always resent and resist efforts to force responsible contractors to part with their lifeblood.

Let us retrace our steps and examine some of our earlier statements. Let us begin with, "As custodians of the public purse, Congress regards it as its sacred duty to obtain for the government everything that the taxpayers have paid for, including title to patents on inventions, and proprietary rights to all that industry develops at government expense."

Let us take the "title to patents" issue first. The key word is the word "title," because, as we have already pointed out, the industry has for many years accepted the existing policy of the Department of Defense, wherein the contractor grants to the government a royalty-free, nonexclusive license to practice, or have practiced, such inventions for all government purposes.

Questions

Please, Senator, ponder the questions, "Why should the government ask more?" and, "What would the government do with these titles?"

Since the government can acquire without argument or cost an unlimited license for all government purposes, but is now claiming titles, it is self-evident that the government is actually seeking the commercial rights invested in these titles, in which case the question becomes, "Who should own the commercial rights in patentable inventions conceived in connection with products being developed at government expense?"

Let us clarify the problem by making the following assumptions:

(Continued on page 41)

When data is on microfilm in FILMSORT Aperture Cards, facts that speed production are at your finger tips in just 90 seconds. And with a THERMO-FAX "Filmac" Reader-Printer you can take more than a look—you can take an enlarged copy in seconds

Microfilm really became practical for government and industry only a few years ago when Minnesota Mining and Manufacturing Company introduced THERMO-FAX "Filmac" Reader-Printers. For the first time, the advantages of a reader and a printer were combined in one compact, low cost unit. Today there's a "Filmac 200" Reader-Printer that has a huge viewing screen, simple pushbutton operation, makes copy after copy in 18" x 24" size or half size prints of engineering drawings and data from microfilm in FILMSORT Aperture Cards. A "Filmac 100" Reader-Printer delivers 8½" x 11" copies in seconds from microfilm in rolls, jackets, and aperture cards.

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Hands Off

(Continued from page 39)

1. Such a product was developed under a government contract with an industrial contractor.

2. The government's need was for a product of such a nature as to require a degree of specialized ingenuity.

3. The contractor was fully reimbursed for all of the time and effort actually expended in performance of the contract (plus a reasonable profit).

Under the foregoing conditions, the question as stated would encompass two situations: firstly, because a patentable invention occurred in the process of the government contract, the word "rights" would include patent rights to the feature of the product which was a patentable discovery; secondly, there would always remain the problem of proprietary manufacturing rights in the balance of the contractor's drawings.

Contributions

The government's payment was a contribution to the development; and, therefore, the government is entitled to a royalty-free license in the first situation, and, of course, can negotiate for manufacturing rights in the second. However, said license and rights must be clearly limited to application for government purposes only. Normally, the government's need is for hardware, not manufacturing rights.

The contractor also made a valuable contribution by supplying the accrual of his investment in facilities, skills and a wealth of specialized background of technical knowledge; therefore, he is entitled to all commercial rights.

Such distribution is fair and equitable. It, Senator, is consistent with free enterprise. The contractor is in business; he has the right to capitalize on his investment. The government has no business exploiting the commercial market; therefore, has no conceivable need for commercial rights. Prosperous contractors are good for the economy. The government reaps dividends in the form of taxes.

The public benefits by the availability of an improved product. Therefore, common sense lines up with the above ethical and equitable distribution of the rights to manufacture. Likewise, in the event of a need for reprocurement by the government, ordinary prudence in the consideration of such factors as reliability, safety, interchangeability, etc., as well as fair play and equity, are substantial reasons why the government should continue to support the original design manufacturer unless his prices are unreasonable.

Now, let us examine the other half of what Congress says must be garnered in as having been paid for in government contracts, namely the manufacturing rights in drawings. This is by far a much bigger issue than the patent issue. The present policies and practices are having a widespread devastating effect, because they remove the profit incentive and therefore discourage the many thousands of small, large and medium sized contractors who are organized to, and should be contributing to our vital defense posture, by participating at any level of contracting or subcontracting with the military agencies.

Perhaps the problem, in practical application, can best be understood by examining a not too hypothetical case, truly typical of countless and daily occurrences. The Air Force awards a research and development (R & D) contract to North American Aviation, Inc., to develop a supersonic bomber (B-70). North American, in turn, competitively selects The Garrett Corporation to develop the air data computing system. Among the components required for the air data system will be a highly sophisticated valve assembly of a type in which Airborne Research and Development Corporation specializes. The Garrett Corporation develops a specification citing the size and performance characteristics of the needed sophisticated valve, and solicits bids from all the inventive firms known to be advanced in this highly specialized field. Garrett also indicates the quantity it expects to need.

Inventive Willie

Airborne studies the requirements, determines that it can design the required valve based on its prior experience, and proceeds to quote Garrett a fixed price on the proposed quantity of valves. The Garrett Corporation selects Airborne's proposal as being the best (price being only one of the several important factors considered). It places the order with Airborne, who incidentally is small business and obviously, at this point, has assumed a substantial risk. It has no contract with either the Air Force or North American. It has only a purchase order with The Garrett Corporation, who will pay him for his valves at the agreed price when he delivers them, provided they perform as specified. In short, this typical "Inventive Willie" is financing all of his own development; and if his engineers fail to come up with a satisfactory end product, he will have a plant full of unsaleable goods for which he cannot collect a dime.

But, what were the contractural obligations which were imposed on him? North American has, in its R & D contract, accepted two mandatory, and thus inescapable, contractural conditions: first, a requirement for complete data (drawings, processes, lists, etc., etc.); and second, the "unlimited rights in data" clause. Both of these requirements are coupled with a third mandatory condition, namely that they must be passed down through all the tiers of subcontracting. Thus, North American had no choice but to impose these same three contractural requirements on The Garrett Corporation, who likewise had no alternative but to pass them on to Airborne.

A Forfeiture

Obviously, by this link chain every one of the thousands of "Inventive Willies" throughout the land, who contribute their genius and risk their dollars on any research and development contract for the Department of Defense, must furnish their drawings, processes and lists to the government and, in the process, forfeit their normal protection whereby they would carefully and deliberately withhold their private knowledge from any would-be pirates. The only exceptions to the "unlimited rights in data" clause are the "commercial items" and products previously developed at private expense.

Now, back to "Inventive Willie." His valve is not a "commercial item," having no known use except in this application. It is not a previously developed product except in the sense that it fully employs all the intelligence gleaned from products previously developed by and at the expense of his company.

Neither will "Inventive Willie" be paid for the right to use his know-how, even when it is used to directly foster grossly unfair "bucket shop" type of competition against him. Recognizing his legitimate competition, George the Gadgeteer, Pete the Pioneer, Creative Charlie, etc., who also supported the necessary overhead to study The Garrett Corporation's specifications, but entered losing proposals, he probably did not even include the recovery of his development costs in his proposal for the initial quantity. He gambles that opportunity for future sales will justify the risk.

Like George, Pete and Charlie, his technical know-how is his stock in trade; to all of them it is the very reason for being in business. It is fiercely competitive! It is both price-

(Continued on page 47)

What Civil Service Needs:

A Real Career Program for Executives

One of the Army's civilian personnel directors presents a "REAL" civil service career program patterned on the systems for Regular Officers in the military services and Foreign Service Officers in State. The Program would include all executives up to and including the Service Secretaries and the Secretary of Defense.

by Wilson R. Hart
Deputy Director of Civilian Personnel
Army Signal Corps

Although it has always been a fundamental concept of our constitutional government that the military chiefs of the armed services must be subordinate to civilian executives, until the end of World War II, responsibility for the actual management of the military departments rested almost exclusively in the hands of commissioned officers of the two military departments.

Since 1947 there has been a managerial revolution in the armed forces. With the creation of the Department of Defense in that year there began a proliferation of new civilian executive jobs at the highest levels of the military establishment. Today there are in excess of one thousand secretaries, deputy secretaries, assistant secretaries, directors, deputy directors, and other high ranking civilian executives in the Department of Defense and the departmental headquarters of the three services who exercise control over the day-to-day management operations of the military services.

Many of these jobs are filled by political appointees. Generally they are extremely able men—but they are also frequently men who have made their reputations in private business or in civilian professions and have had little or no experience in military affairs or in governmental administration. Furthermore, they are likely to be "in-and-outers" who frequently return to their more lucrative civilian vocations before they have had an opportunity to learn their jobs. Finally, they are subject to wholesale replacement every four or eight years when there is a charge of administration.

Simultaneously civilians have been infiltrating virtually all of the non-tactical operating activities of the military services. Prior to World War II the Army and the Navy employed a number of civilians, but almost exclusively as clerks and laborers. Today there are several hundred thousand supervisory and "middle-management" executive and professional jobs in the military services filled by civilians.

These jobs are virtually all filled through the workings of the federal Civil Service system. The inadequacies and anachronisms of that system have been laid bare by the Hoover Commissions, the Cordiner Committee, and so many other competent analysts and scholars that they do not require reiteration.

Let us assume that this trend toward dependence upon civilian executives and administrators at all non-tactical echelons of the military services is—rightly or wrongly—irreversible. If so, it is inescapable that a better way must be found to get and to keep high caliber executives than is now offered by either the political appointment system or the cumbersome Civil Service system. That "better way" lies, I submit, in the development of a REAL career program for civilan executives in the Department of Defense.

What is a REAL career program? The Regular Officer system followed by the Army, Navy and Air Force, and the Foreign Service of the State De-

(Continued on page 46)

HOFFMAN'S NEW TACAN FIRST* TO MEET "AGREE" SPECS

Hoffman, first to be selected by the Air Force to produce major equipment under Defense Department's new "AGREE" specifications (Advisory Group on Reliability of Electronic Equipment).

GREATER RELIABILITY

Reliability increased 700%. MTBF raised from 17½ to over 150 hours with a service life in excess of 2000 hours.

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Operating altitude raised from 50,000 feet at half power to 70,000 feet at full power—without pressurization. Number of equipment missions increased!

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48.5 lbs. compared to 61 lbs. of predecessor models.

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Government officials estimate savings on maintenance costs alone of the Hoffman-designed AN/ARN-21C will amount to over $125 million.

* *Hoffman is the only manufacturer now delivering airborne TACAN equipment in quantity to the Air Force.*

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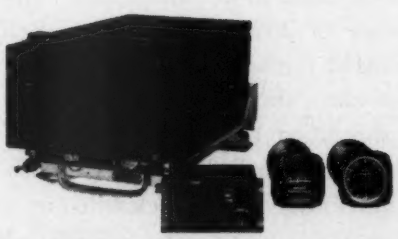

NOTE:—This same system is custom-packaged with interchangeable modules for F-104, T-38, B-58 and XB-70 airplanes.

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the most practical solution to problems of micro-miniaturization, heat, and nuclear radiation in military electronic systems

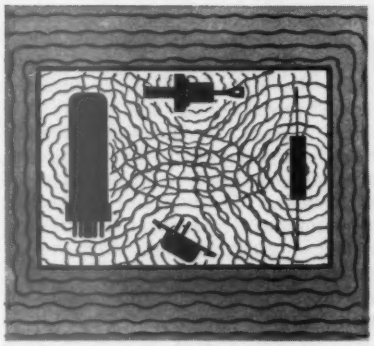
TO MILITARY AND DEFENSE SYSTEMS MANAGEMENT:
An urgent invitation to support the TIMM circuit program in vital electronic systems involving aircraft, space aeronautics, surface weapons, ground support equipment, and data processing.

TIMM CIRCUIT FEASIBILITY HAS BEEN DEMONSTRATED
Many military and defense electronics projects currently under development, or pending, will benefit greatly from the practical miniaturization and proven high-temperature performance of TIMM assemblies. Reliability is inherent in TIMM circuits due to the initial choice of materials, processes and interconnection techniques. Logistics are simplified by the use of circuit building blocks made up of standardized TIMM assemblies which can be stored indefinitely, even at elevated temperatures.

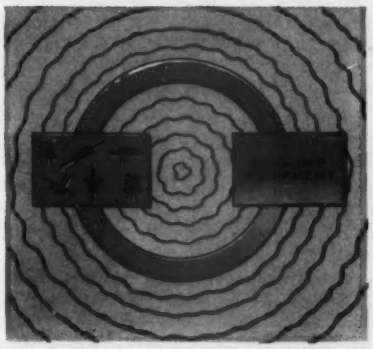
TIMM assemblies represent a significant advance in micro-miniaturization techniques in that electronic equipment can now be designed which becomes more efficient and more reliable as packaging densities are increased.

This TIMM circuit for a bistable multivibrator has an operating temperature-limit of 580°C and a component density of 250,000 parts per cubic foot as compared to 250°C and 26,350 parts per cubic foot for the best conventional circuitry. Depending on frequency and output requirements, component densities as high as 1,000,000 parts per cubic foot are possible.

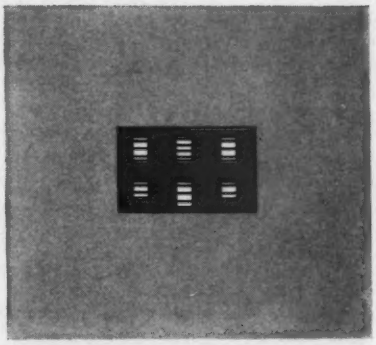
TIMM DEVICES BREAK THE THERMAL BARRIER OF MICRO-MINIATURIZATION



All electronic components give off heat when operating, resulting in lost power and high temperatures inside the electronic package. Progressive miniaturization increases the internal temperature and ultimately creates a thermal barrier (due to the use of temperature-limited components) which prevents further miniaturization.

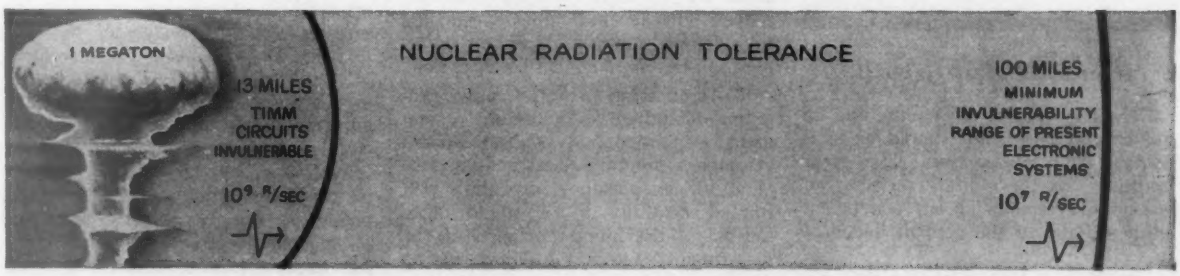


At some point in the miniaturization process, it is necessary either to remove heat from the equipment package or increase the temperature ratings of the components. Conventional components require bulky cooling equipment to maintain satisfactory operation, thereby sacrificing space, weight, and ultimate system compactness.



TIMM is designed to operate at 580°C and therefore smash the thermal barrier associated with conventional components. By insulating the equipment package to conserve heat, and by increasing component density, very little input power is required. TIMM units eliminate the need for cooling equipment and allow maximum component density.

PREVENT MALFUNCTION FROM NUCLEAR RADIATION AND HEAT



TIMM circuits, constructed only of metals and ceramics, tolerate more than 10,000 times the nuclear gamma-pulse radiation of circuits employing conventional devices. High-temperature operation of these materials eliminates output transients which normally result from high intensity gamma pulses. All materials used in TIMM circuit construction are at the top of the steady-state nuclear radiation tolerance scale.

TIMM assemblies are the only active components capable of operation at temperatures as high as 580°C. Even in high-temperature ambients, such as in missile nose-cones and re-entry vehicles, increased component and power densities are possible without the use of bulky cooling equipment. Constant high-temperature operation provides outstanding component stability and allows unlimited circuit-design possibilities.

Only a small portion of the TIMM circuit story can be told here. For more complete information, or to arrange a personal visit, write or call:

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Civil Service

(Continued from page 42)

partment are familiar examples of a REAL career program. While there may be some room for honest difference of opinion concerning what distinguishes them from other so-called career programs, it can, perhaps, be agreed that the following seven elements which are present to a marked degree in each of these programs are essential to a REAL career program:

The Seven Elements

1. In-put is at the base level. Vacancies at higher levels within the career corps are filled by advancement from within.

2. All members of the career corps hold rank-in-person. Their grade or salary does not depend upon the duties they happen to be performing at the moment. Promotion to the next higher rank is based upon an evaluation of the personal qualifications of each individual member of the corps rated competitively with each other member holding the same rank. Promotion may not be effected by job reclassification.

3. Only certain categories of jobs are filled by members of the career corps. No pretense is made at blanketing all personnel and all jobs into the career corps. Many others may serve the same organization in jobs of permanent or indefinite tenure without ever being admitted to the career corps. Generally, only those jobs which demand outstanding *leadership* ability as a *primary* qualification are identified and filled, whenever possible, by members of the career corps.

4. Retention and advancement in the career corps are highly competitive. Evaluation is accomplished by a comprehensive, formal, uniform, objective rating system. Persons being rated must be informed of their ratings but do not have the privilege or the opportunity of appealing an unfavorable rating to any individual or agency outside of the chain of command. Those who do not achieve or maintain sufficiently high ratings are subject to dismissal from the career corps—though not necessarily from the service—without the right of appeal to any outside authority.

5. Members of the corps are required to engage in continuous planned self-development. Individual self-development plans are career-oriented; not job-oriented. They consist of education rather than training. Degree of progress in successfully completing planned self-development programs constitutes an important element of each individual's efficiency rating. Costs of self-development are normally borne by the employer, but each individual is expected to pursue a substantial portion of his own self-development on his own time.

6. Administration of the career program, including recruitment, assignment, promotion, approval of self-development programs, and maintenance of all official personnel records is performed centrally by a single office located at the highest echelon of the department. Members of the corps do not have the privilege of rejecting reassignment or transfer.

7. Those who achieve the pinacle of success in the program ultimately qualify for appointment to some of the most important and responsible non-elective jobs in the Government (e. g., Chief of Staff of the Army, ambassadorships, sub-cabinet and cabinet posts, etc.).

It may be observed that such existing programs as the Army's Civilian Career Management Program do not contain *any* of the essential elements of a REAL career program. It may be argued validly that there is no career program in the Government—nor anywhere else—which embodies each of these elements 100%.

Even the regular military services (i. e., the uniformed, commissioned officer corps), the Foreign Service, the FBI, and others generally credited with having REAL career programs have, from time to time, deviated or made compromises on one or more of the seven elements. For example, the Army's regular officer integration program violates the principle that all input to the career corps should be at the base level.

On the other hand, such synthetic career programs as the Army's Civilian Career Management Program have moved slightly in the direction of observing, at least in theory, some of the elements. The extent of observance between the REAL and the synthetic is still so great, however, that, for all practical purposes the difference may be properly regarded as one of kind rather than of degree.

Policy Implementation

Reforms in the field of civilian personnel administration such as those advanced by the Hoover Commissions and the Cordiner Committee have, in most cases, been permitted to gather dust because they are impossible to implement without some form of enabling legislation. No changes in the existing Civil Service laws are necessary (some may be desirable or helpful), however, to establish a REAL career program for civilian executives in the Department of Defense. *It is entirely feasible and practicable to set up a REAL career program under the existing statutory powers of the Secretary of Defense and of the secretaries of the three services.* All that is necessary is the executive promulgation and implementation of the following policies:

1. Every executive job in the Department, excepting only those which include as a major duty the command of tactical troops or which *require* past experience in a tactical command, *may* be filled by members of the civilian career corps. The ultimate and announced goal of this policy is to encourage the development of civilian career executives who are better equipped to fill *any* executive job in the Department, *including* the jobs of Secretary of Defense, Deputy Secretary of Defense, Assistant Secretaries of Defense, secretaries, undersecretaries, and assistant secretaries of the services, and other top-flight executive positions, than anyone who is available from any other source.

2. When a member of the civilian career executive corps is available, and is the best qualified person available, to fill *any* vacant executive job (with the two exceptions noted above), he will be assigned to the job, notwithstanding any pre-existing doctrine or tradition to the contrary.

(Continued on page 50)

Lovett's Appraisal:

"The Department of Defense and its military establishments should be non-political and non-partisan. The great tradition that the military services are non-political should, I am convinced, apply equally to the civilian heads of these departments . . .

"It takes a long time for an able man, without previous military service of some importance and experience in Government, to catch up with his job [in the Department of Defense]. At a guess, I would say he could pay good dividends to the Government in about two years . . .

"To lose him before he becomes productive is manifestly a serious waste of the effort that went into his training. How to hold him is a problem to which I do not know the answer. But I have a feeling that, in many cases, the cause of his leaving lies in the conditions surrounding his entry into the Government and his terms of employment in the first instance."

—Robert A. Lovett, former Secretary of Defense, in testimony before Senate Subcommittee on National Policy Machinery February 23, 1960

Hands Off

(Continued from page 41)

less and unpriceable. How, Senator, would you ever put a price on your knowledge? One thing is certain, if Inventive Willie had included even a very modest price for the unlimited rights to use his data, he would have automatically eliminated himself from the competition.

A contractor's manufacturing drawings and processes frequently contain proprietary information and trade secrets. Our courts have long held that trade secrets are private property under the law. Today's practices amount to the wholesale confiscation of this private property. It is being done legally, of course, because our Inventive Willies were forced to accept the harsh terms dictated through the layers of the Department of Defense contracting and subcontracting. But, Senator, how can you reconcile this abuse by the Department of Defense of its bargaining position with the intent of the following quotation from the Constitution of the United States, *"Nor shall private property be taken for public use, without just compensation" (Fifth Amendment)*?

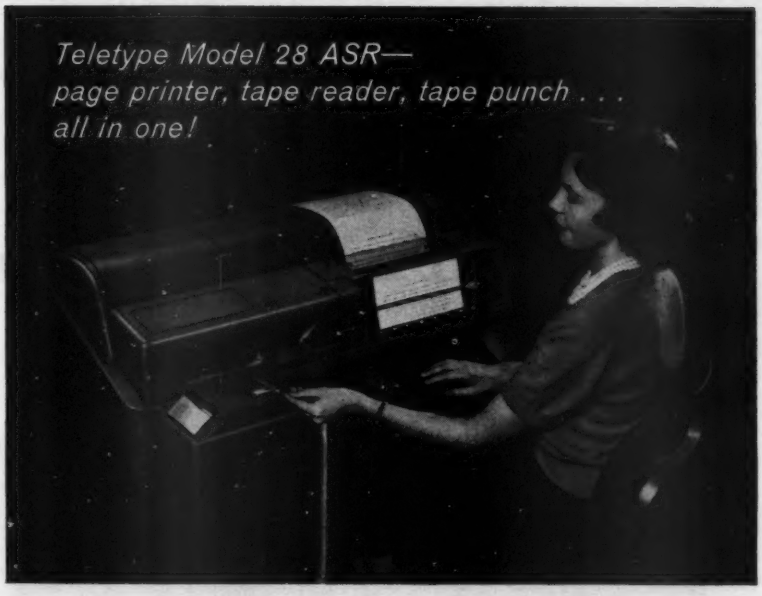
I never expected to be pleading the Fifth Amendment, but I do so now, Senator!

Perhaps, one of Congress's many investigating committees should look for the causes of this incredible departure by the government itself from the path of ethics, fair play and the intent of law. The Department of Defense has adopted these confiscating practices, not because they wanted to, or believed in them, but simply and solely because of their inability to withstand the unrelenting pressures from certain representatives and senators, the General Accounting Office and the Small Business Administration who in their zeal to get blood out of the turnip for "Little Joe," have in reality made his position much worse.

Please, Senator, ask Inventive Willie, or George or Pete or Charlie, to take the witness stand. Let any one of these valuable and deserving American citizens tell the story of "unlimited rights—or else." Their names are legion, and can easily be found in the yellow pages of any telephone book.

Just a minute, Senator. May I please quote from yet another passage of the Constitution of the United States, this time from the Fourth Amendment: *"The right of the people to be secure in their persons, houses, papers, and effects against unreasonable searches and seizures shall not be violated."*

Which way are you going to vote, Senator? For the toboggan ride or against it? ■



A compact data communications center

The Teletype Model 28 ASR set is a machine of many talents—time and money saving talents that are ready to go to work in your data and message communications systems.

The page printer provides facilities for sending and receiving on message paper or sprocket-fed forms. It can also be used for preparing records or as a read-out device. Platens are available to accommodate a variety of form widths, from 3⅝″ to 9″.

The punched tape equipment is unusually flexible and versatile. Facilities are provided for encoding data into tape (with or without printing on the tape) . . . transmitting from tape . . . integrating repetitive data from previously prepared tape with variable data by keyboard . . . obtaining punched tape as a by-product of communications for computer and other business machine input. There is a choice of four different punches and four different readers and, where additional tape punch facilities are needed, a model is also available with an auxiliary tape punch.

In addition, the Model 28 ASR comes equipped with a "big plus"—the Stunt Box, a built-in programming mechanism that offers an inexpensive solution to a wide variety of remote control and switching tasks, such as automatic station selection and telemetering.

All of these facilities are available to you in a compact console measuring approximately 39″ high, 36″ wide and 23″ deep.

Teletype Corporation manufactures this equipment for the Bell System and others who require the utmost reliability from their data communications facilities. Teletype equipment can be used with Data-Phone and other communications services.

For a free brochure on the Model 28 ASR, write to Teletype Corporation, Dept. 77-E, 5555 Touhy Avenue, Skokie, Illinois.

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The firing line in a quiet

revolution

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Hughes was in the midst of a staggering electronics manufacturing assignment. Hughes had to *mass-produce* the most complex kind of electronic brain yet conceived—with literally thousands of miniature parts and delicate connections.

Yet, these brains had to be built to the highest standards of reliability, tight schedules had to be met and costs held down.

These challenges urged Hughes engineers to bold immediate solutions. First was the adoption of advanced computer techniques for production and inventory control.

This marked a major forward step—purchasing and inventory became virtually "exact sciences." Each was integrated into the needs of production. Costs tumbled. Engineering changes could easily be made. And over-all efficiency soared.

Second was the development of the Videosonic system. Here, pictures and recorded voice instructions guide workers through each step of assembly. With the Videosonic system, an untrained housewife can practically train herself. In days she is competent to begin building complex electronics assemblies that took engineers months to design.

From this basic idea of "controlling the flow of materials through men and machines" have come numerous other improvements, too.

Hughes-initiated quality controls are now widely copied in the industry, and cost improvement programs saved Hughes' customers over $6.5 million last year.

This major manufacturing resource is matched by the creative abilities of Hughes 5,000 engineers and scientists. This combination has developed and built components and systems which have earned the confidence of users throughout the free world.

Videosonic Assembly Techniques *represent the most important development in line flow since the standard assembly track. This Hughes device regularizes flow, maintains reliability and quality, reduces worker fatigue.*

HUGHES
Advanced Electronics Manufacturing
El Segundo, California

Creating a new world with ELECTRONICS

HUGHES

HUGHES AIRCRAFT COMPANY

Civil Service

(Continued from page 46)

To implement and administer the civilian career executive program it will be necessary for the Secretary of Defense, acting through a "deputy" or "director" clothed with appropriate delegated authority and functioning as an integral part of the Office of the Secretary to undertake four actions.

First he would conduct an annual nation-wide recruitment campaign. All selectees must be college graduates, preferably with a master's or LL.B. degree. They must have fulfilled their obligation for military service and be under 30 years of age. Each must take and pass an examination comparable in difficulty to that required of candidates for the Foreign Service. Those selected would be given Civil Service appointments at the GS-7 or GS-9 level.

Second would be assignment of each appointee to a job in a major career field (e. g., comptroller, supply, personnel, R&D management, etc.) at a field installation. He would be given the most demanding job assignments practicable and his performance would be periodically evaluated by all of his first- and second-line supervisors.

The Requirements

If he maintained a sufficiently high level of efficiency he would be advanced to the GS-11 level by the time he had completed three years' service at the field installation. He would then serve successive three year tours at the GS-11 and -12 levels at a headquarters command in the CONUS and at an overseas command. Normally he would remain in the same career field throughout this early portion of his career.

If at any time he failed to advance on schedule to the next higher grade because he had failed to maintain his performance rating above the prescribed level, he would be dropped from the career corps. He would not, however, be separated from the service. He would remain without prejudice or stigma in the "permanent" civil service at the same grade. Elimination from the career corps will not constitute an "adverse action" under Civil Service regulations. When he successfully reaches the GS-13 level (after approximately nine years' service at about age 34) he would serve one three-year tour in another military service and one in another career field.

Thus, if he has maintained a good enough record, he should, by about age 40, attain the GS-15 level. Once he reached that level, he would no longer be subject to removal from the corps except for cause. In other words, he would not be dropped because he failed to be selected for further advancement. Promotion beyond the GS-15 level would be on a purely competitive basis as vacancies become available.

The third action would require each member of the corps to plan a program of self-development at the beginning of his career. While no arbitrary degree requirement would be imposed, each would be expected to pursue a course of research and study equivalent to that required of doctorate candidates. These research and study projects should be completed by the time they have reached the end of fifteen years' service.

Between their tenth and fifteenth years of service, the corps members would be eligible for one year's leave with pay to engage in independent study and research, to take graduate level courses at a civilian university, or to attend an advanced service school such as the Industrial College or the War College. Each would also be expected to make a creative contribution toward the advancement or improvement of the management effectiveness of the military establishment. His accomplishment in each of these areas would be evaluated and would form a significant, integral part of his career performance record.

Fourth and final action would control the assignment of all members of the career corps. No one would be integrated into the corps at any level other than the entrance level (GS-7 or -9). No permanent Civil Service appointee would be removed to make room for a member of the career corps. However, as the program developed, all vacancies in the direct line of promotion below the top executive positions of the Department would fall under the control of the Director of the career corps.

The Powers

This control would give the Director the power to bestow upon members of the career corps the practical equivalent of "rank in person." Since they would be Civil Service employees they would, from a strictly legalistic viewpoint, still be subject to "rank in job." They would be immune, on the other hand, from all the practical liabilities of the latter status.

The *jobs* which they occupied would still be legally subject to up-grade or down-grade by virtue of job reclassification or to abolition and invocation of reduction-in-force procedures, etc. The *individuals* would not be subject to the personnel actions which normally follow, however, since they would be moved to another job of appropriate classification and grade before any of these eventualities would ever befall them.

As vacancies occurred, the Director would be called upon to fill them with members of the corps wherever possible. In filling jobs which may, under prevailing law and custom, be filled by either military personnel or civilian—or by either non-career (i. e., politically appointed) or by career civilian personnel—the option would still exist to select the best man available from either of the three categories. On the other hand, in filling any classified Civil Service job (GS-18 or below) no one outside of the career corps could be appointed or promoted if a member of the career corps were available.

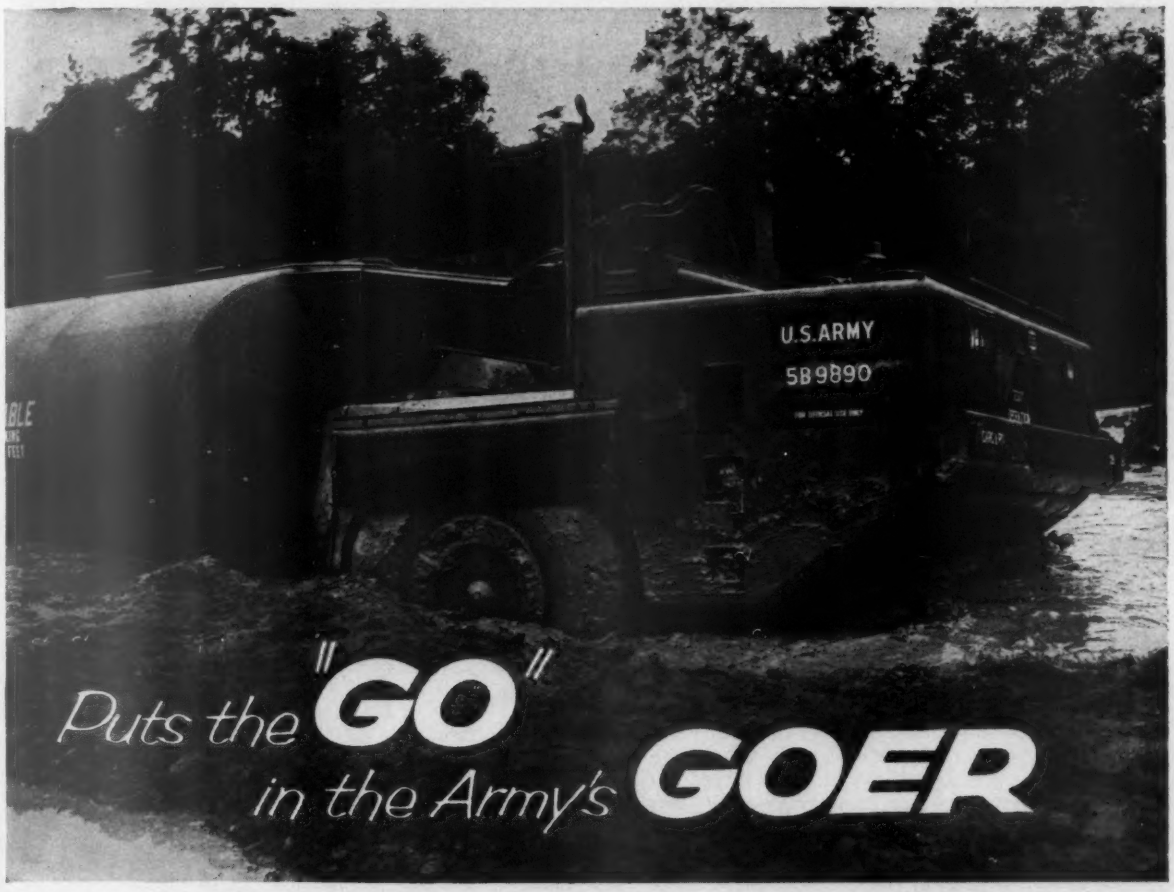
The Opportunities

The membership of the career corps would never be permitted to rise above a fraction (e. g., ¼ to ½) of the total number of jobs in the department which could potentially be filled by members of the corps. On the other hand, the percentage of jobs filled by members of the corps would be relatively small at the GS-9 level and high at the supergrade level. The ratios would be roughly analogous to those presently prevailing in the Army where the majority of Second Lieutenants are "non-regular," whereas virtually all of the Generals are "Regular Army."

In summary, a REAL career program for civilian executives would attract the best young men in the country because it offers them an opportunity to rise, on merit alone, to some of the most responsible jobs in the world. It would stimulate them, through competition with others of equally superior ability, to put forth their supreme effort, both on the job and in pursuit of personal self-development. It would develop an esprit-de-corps unknown today in any Civil Service-manned federal agency. It would provide the military establishment with a hard cadre of high-caliber civilian managerial talent *at all echelons* which is totally unavailable under prevailing methods of executive recruitment, development, and utilization.

All that it would require of us in return is that we jettison some of our long-cherished but outmoded concepts of civilian personnel management. We must face up to the fact that in order to get the *benefits* of a real career program we must *have* a REAL career program. It would also help if we could muster enough boldness to recognize that those who always insist on walking before they run seldom win foot races. ■

GET REAL PRODUCTIVITY—GET A GM DIESEL ENGINE



Rough cross-country terrain . . . shifting sand . . . thick mud . . . 30-inch vertical walls . . . small rivers—not one of these will stop the Army's GOER.

For the GOER is a new concept in military vehicles for logistical operations—designed by LeTourneau-Westinghouse and Ordnance Tank & Automotive Command to operate literally anywhere on land.

And the engine that gives the GOER its "go" is an "8V-71" GM Diesel—a compact, lightweight power plant that delivers 274 horsepower at 2300 r.p.m. to this multipurpose vehicle.

The "8V-71" packs more punch than any Diesel offered to the Armed Forces in years—has the compactness and lightness to fit where other Diesels won't. It gives the military the power they need to do a better job—faster—in all types of equipment.

If you're looking for a Diesel to do a better job—or a special job—take a look at the GM Diesel All-Purpose Power Line. You'll find engines covering the range from 20 H.P. up in only three cylinder sizes—engines adaptable to any military application. And these engines have won their spurs in every branch—in the toughest kinds of military service.

Want to know more? Write us—we'll be glad to give you full information.

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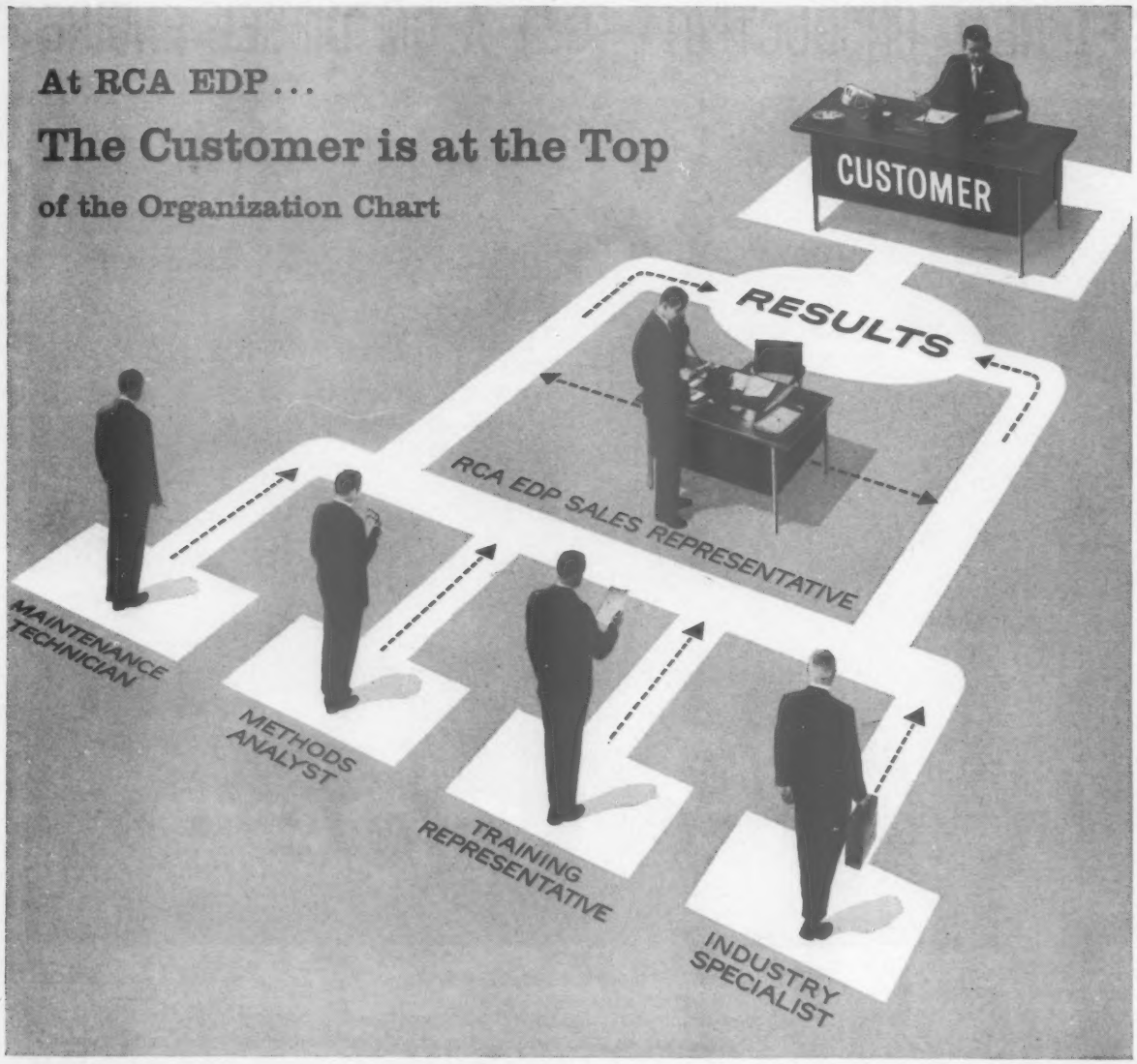

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You make your needs known to your RCA Sales Representative. He can call into action a full team of RCA specialists to help solve your particular problems. If you need expert assistance on systems and procedures . . . or a programmer to help solve a problem . . . or a mathematician to help in Operations Research . . . or skilled people to orient management and train personnel . . . all are available to see that you get the results you want. And, of course, the RCA Service Company, the world's most proficient organization in electronic maintenance, is always at hand.

RCA's firm commitment to a policy of responsiveness to customers' needs makes thorough "backup support" as much a part of every RCA EDP System as the "hardware" itself, with its tremendous *WorkPower* and unique versatility. In simple terms, it means that you get *more work per dollar* invested . . . day after day, year after year.

No matter how modest or complex your data processing requirements may be, you'll gain by talking it over with RCA. RADIO CORPORATION OF AMERICA, Electronic Data Processing Division, Government Marketing Office, Washington 6, D.C.

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Research Rundown

Army Increases Power Research

Army's Research and Development Division has earmarked $8.3-million for stepped-up studies in several areas including revolutionary power systems utilizing fuel cells and converters. Other projects to be explored are improved ammunition developments, and lightweight air transportable and air droppable artillery, trucks and carriers. The Army's total for basic research is about $50-million per year, expended through more than 400 universities and other research organizations. This represents about five percent of the total RDT&E budget.

Air Force Keeps Staff at AEC

Proposed termination of the nuclear-powered aircraft project, upon which about $1-billion has been spent so far, does not mean that the Air Force has lost all interest in the subject. An Air Force brigadier general and about two dozen other USAF officers on assignment to the Atomic Energy Commission in connection with ANP will remain with AEC. But, for the time being at least, they will concentrate on applied research in engines and metallurgy even though they are convinced that the ANP airframe deserves equal priority. Meanwhile, AEC pressure is reported building up to use the Air Force officers' talents on other projects.

Marines Seek GEM Landing Craft

Marine Corps interest in air-cushioned vehicles for amphibious landings has added new impetus to research and development on Ground Effects Machines (GEM). At least one company—Ford Aeronutronics—is ready to do business. For the past 15 months, the firm has been solving GEM problems with an engineering prototype and now is ready to sign a development contract. The Army might be even a better customer on the basis of a World War II record of 48 major amphibious landings as compared with 16 for the Marines.

Study Continues On B-70 Project

Recommendations against development of the B-70 as a full-scale weapon system are not expected to produce a major shake-up in the Air Force staff assigned to the project. With the blessings of the Administration, the development program will continue in an effort to demonstrate the technical feasibility of the aircraft structure and configuration "as well as certain major sub-systems required in a high speed, high altitude environment." The present B-70 project group will be used and the studies will be financed by $220-million for FY 1962.

Defense Tightens On Missile News

Defense has blacked out publicity on missile shots that go astray when the experiments are conducted at sea or in remote areas. In an official directive to all agencies concerned, the department ruled that the release of information on unsuccessful shots was not in consonance with national interests. Ever since the widely-publicized failure of the first Vanguard in 1957, Defense has been super-sensitive on missile firing reports. The new directive is designed to eliminate all but official reports, which may be deemed appropriate. It is expected to restrict unofficial reports to those on shots fired within the observation range of spectators.

New Rules Cover Space Projects

Amplification of orders allotting space technology responsibilities to the military services, with the Air Force the principal beneficiary, now calls for prior Defense approval of all programs involving more than $200,000 annually. Under the new instructions, prior Defense approval must also be obtained when annual costs of an approved program are increased more than 50 percent. The instructions are an extension of the recent Defense directive which gave the Air Force almost complete responsibility for space research and development.

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32 PAGES OF ANSWERS
TO HIGH CLERICAL COSTS

Here is the story of the new Wassell Work Organizer principle of filing — full of ideas and examples of how major firms are using Wassell filing systems to save time and dollars.

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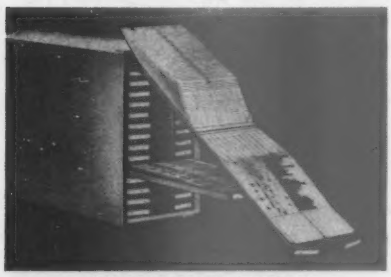

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You'll find these exclusive advantages in Wassell Visible Sig-Na-Lok:

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Research Rundown

Navy Seeks $16-Million For Research Hydrofoil

Navy has informed Congress that it is asking $16-million for development of a programmed hydrofoil research ship primarily for use in anti-submarine warfare. Emphasis will be given to provision of maximum payload, VADM Wallace Beakley told the Senate Armed Services Committee.

(Hydrofoils are essentially lifting surfaces, somewhat like aircraft wings, which extend below the ship's hull. When the vessel has been propelled to a certain speed they lift it entirely out of the water. The resulting reduction in water resistance enables hydrofoil ships to achieve ultimate speeds three to five times those of conventional craft.)

The ship is 155 ft. long with a displacement of about 300 tons and is designed for maintaining high speeds in sea conditions that would reduce the speed of conventional ships of the same size.

Beakley said the powerplant and transmission "will be designed to allow future investigation of much higher foilborne speeds. It is expected that a great deal will be learned from this ship about the future of seagoing hydrofoils and their use in ASW."

The only other hydrofoil ship is a small submarine chaser of 110 tons, designed primarily for operation inshore or in coastal waters.

The Martin Company has already received a $110,000 Navy contract to study the structural aspects of large hydrofoil ships.

The drastically higher speed will give the ship a maneuvering capability (under military fire) not found in the fastest current ship. It also offers a high potential in antisubmarine warfare, where speed above water becomes particularly necessary to combat fast, evasive, modern nuclear-powered submarines.

New Readiness Monitor Tested on Army Aircraft

Electronic checkout techniques, similar to those used in missile launchings, are being tested on Army aircraft to determine if the airplanes are safe for flight.

Army sponsored research into the feasibility of this concept is being carried out by the Bendix Corporation, York, Pa., under a contract with the U.S. Army Transportation Research Command, Fort Eustis, Va. Army may adopt this system in the future.

Known as Project ALARM (Automatic Light Aircraft Readiness Monitor), the concept envisions the use of strategically placed sensors to forecast electronically the condition of various critical mechanical and structural components—saving valuable man hours in carrying out maintenance inspections on Army airplanes and helicopters.

At the present time, extensive mechanical and visual checks are made on an aircraft before it is considered airworthy. Use of electronic monitoring could reduce the inspection time to a matter of minutes and, in addition, may conceivably remove some of the requirements for special skills on the part of inspection and maintenance personnel. A most important by-product of such a system would be the improved safety factor.

Bendix is currently testing the system on one of the Army's new turbine-powered helicopters, the HU-1 "Iroquois." The goal is to design the system so that pilots and crew members will have as much confidence in the electronic monitor as they already have in the conventional instrument panel indicators.

Helicopter May Become Future Fighting Unit

A universal armament kit could give the helicopter an important new role in the modern mobile Army, according to a recent statement by a General Electric armament engineer.

Henry G. Benis, speaking before a meeting of the Institute of the Aerospace Sciences, pointed out that the new kit will offer protection for the helicopter, long vulnerable to enemy attack, and for the first time make it an aggressive fighting unit.

The versatile armament package can be used on a variety of helicopters with only minor modifications, Benis said, adding that the equipment is easily removable and interchangeable.

He explained that helicopter armament can follow either a universal or specialized approach. Specialized armament is usually limited to permanent installations on a small number of helicopters which are restricted to act as heavy weapons ships, Benis said.

"Much study has been devoted to the Kit's sighting mechanism, ranging devices, and lead-angle computers," Benis said, "because of the extreme accuracy necessary when placing explosive chemical, atomic, and biological rounds on their targets."

The Cyrano Radar one of C.S.F.'s most recent productions in the field of airborne fire control.

C.S.F. RADAR AND WEAPON SYSTEMS

For 10 years **C.S.F.** (Compagnie générale de télégraphie Sans Fil) has held the lead in France in the field of military airborne radar.

C.S.F. has made hundreds of radars of different types mainly intended for the French Air Force ; however an appreciable part of C.S.F. radar production went to the Air Forces of other countries.

The ever more complex rôle of aircraft led to the need of a weapon system of which radar formed an integral part.

Having already built such systems the research and production services of C.S.F. have acquired the experience necessary to solve the problems encountered in the design and construction of aircraft or rocket radar equipment and its integration in weapon systems.

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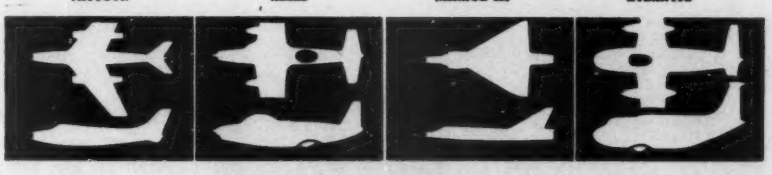


RAPY

C.S.F.

EXPORT DEPARTMENT C.S.F. DIVISION INTERNATIONALE - 79, BOULEVARD HAUSSMANN - PARIS 8e - ANJ. 84-60

Display/Computer System Developed for ASW Use

A system that displays input data from antisubmarine detection equipment and pinpoints target location, as well as presenting basic dead reckoning navigational information for the aircraft, has been contracted for by Navy for installation in Grumman's new S2F-3 ASW "Hunter-Killer" aircraft.

The contract, awarded to the Huyck Systems Company, Huntington, L.I., N.Y., covers the pilot production of the AN/ASN-30 Tactical ASW Display and Computer System which was developed under a previous contract from the Aeronautical Instrument Laboratory of the Naval Air Development Center.

Huyck has incorporated within this system its unique concept of "Miniature Modular Packaging." This unit design of component modules provides an ease of maintenance that allows for trouble-shooting replacement on a "plug-in" basis.

Arctic-Tropic Suit Developed For Navy

An air-conditioned suit that will keep the wearer comfortable in bitter Arctic cold and in extreme tropic heat has been developed jointly by Navy and the Westinghouse Corporation.

The suit was designed for high heat conditions such as those encountered in ship engine rooms operating under battle conditions with all ventilators closed. But it can also be adapted to meet conditions of extreme cold by pressing a single switch.

The suit itself weighs 13 pounds, while the thermoelectric unit mounted on the back weighs 45 pounds, complete with batteries. The only moving parts in the air conditioning system are two small fans which circulate the air around the wearer. Batteries permit the suit to operate freely for one hour. For longer use, the suit can be plugged into a DC electrical outlet.

Heating or cooling of the suit is done by passing a current through thermoelectric couples.

The heating or cooling is done automatically, depending upon the temperature inside the garment. Tests show that temperature of about 80 degrees Fahrenheit is maintained when external temperatures vary from 40 degrees below zero to 135 degrees above Fahrenheit.

Completely air tight, the suit is made of an insulated aluminum coated fabric. Air for breathing is supplied through a face mask connected to the side of the suit helmet, where incoming air is heated or cooled by a small heat exchanger.

Army Plans to Reopen Navy Repair Facility

Plans for reopening the overhaul and repair facility at the Naval Air Station, Corpus Christi, Texas, for use by Army in overhauling and repairing Army aircraft and major aircraft components, have been announced by DOD.

The establishment of this facility stems from a DOD requirement that Army have in being, in the event of an emergency, a repair facility for overhaul of combat essential equipment. In addition, this activity will provide for the technical training of Army personnel required in overseas repair units.

Navy is now operating the base at Corpus Christi and has offered the use of necessary facilities to Army to permit better overall utilization of the base. No new construction will be required to support this new Army mission.

The Corpus Christi Army facility will be operated by Army Chief of Transportation as a field installation of the U.S. Army Transportation Materiel Command, St. Louis, Missouri.

Navy Uses Blimps For V/STOL Tests

Navy, in an effort to eliminate building expensive wind tunnels, has come across a new idea for aerodynamic testing VTOL/STOL aircraft models. The new low-speed testing program, utilizing an active Navy lighter-than-air craft, is being jointly conducted by the Office of Naval Research and Bureau of Naval Weapons.

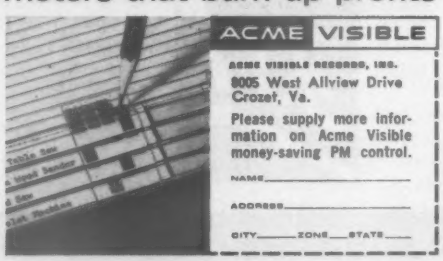
The blimp ASW aircraft can be used to acquire data on plane model tests that would ordinarily require building expensive wind tunnels. Few wind tunnels are available for testing large powered aircraft models and those that are in existence are generally not designed to simulate slow air speeds.

Test models of VTOL and STOL aircraft are hung beneath the blimp gondolas and towed on a retractable 33-foot strut or boom. The testing blimp can remain virtually motionless in the air or attain speeds of more than 60 knots.

Exploratory tests with Navy's 285-foot ZS2G-1 airship have demonstrated its feasibility in the program, Navy spokesmen said. Its larger cousin, the 343-foot ZPG-2 can maintain velocities from zero to 15 knots for about 30 minutes—considered adequate for the tests planned. It can maintain 15 to 60 knot speeds "indefinitely."

Prevent burned out motors that burn up profits

When a dry, forgotten bearing burns out a motor, it can cost thousands of dollars in lost production time. That's why profit-conscious management so often turns to ACME VISIBLE to make preventive maintenance forget-proof. Every need of every motor and machine is visibly scheduled and signaled as shown at right. Service records, cost records, spare parts inventory, stay with maintenance cards. For less downtime and more profitable on-time production, send coupon.



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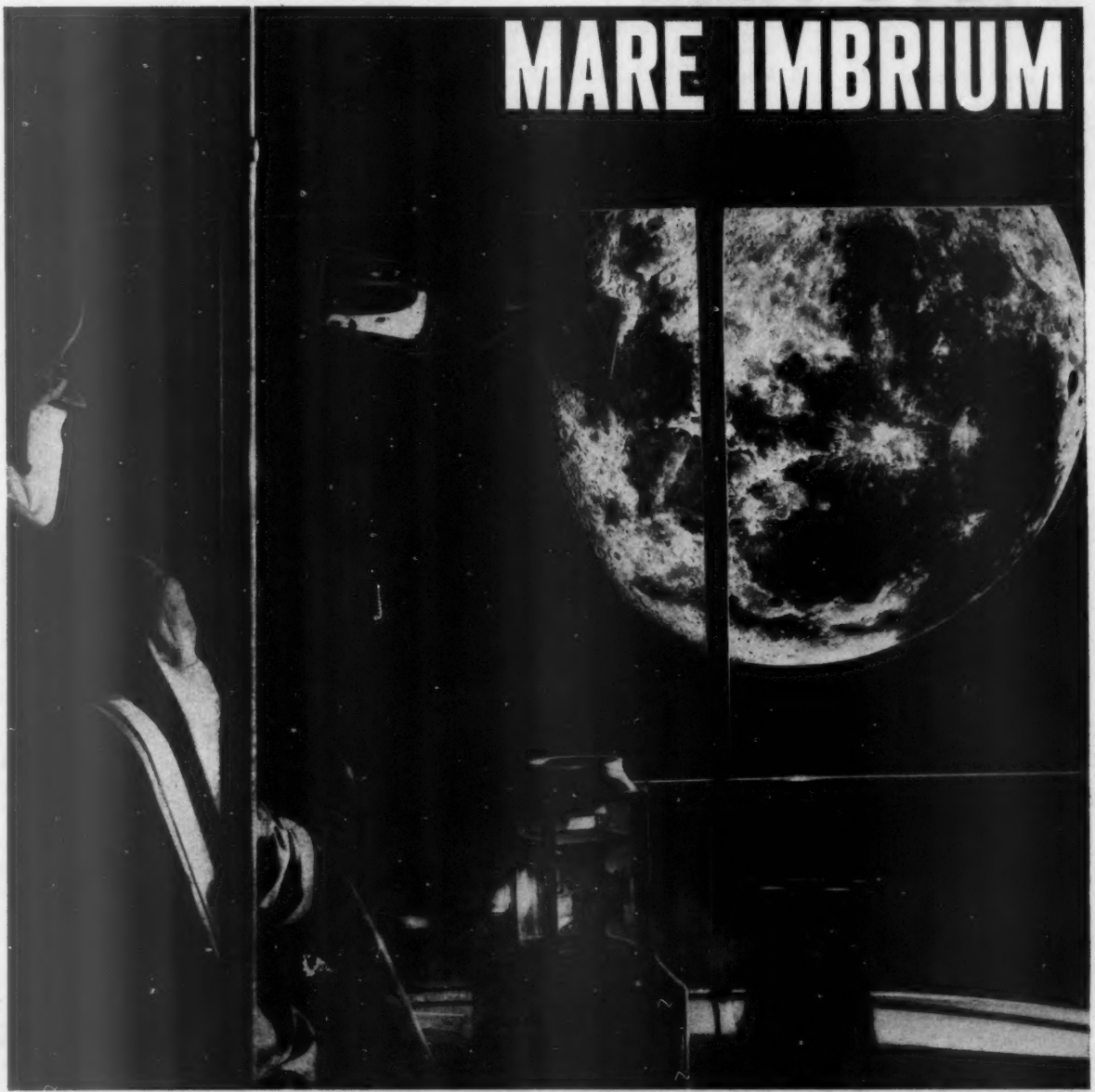

One of the primary needs in the next generation of our space program is for a reliable "space bus"—a vehicle versatile enough to carry a variety of exploratory packages to the moon and possibly to the near planets. Once it is injected into a lunar or planetary trajectory, this bus will have to guide itself to its destination, accomplish a soft landing, release and activate its payload.

The problems involved in the design and fabrication of such a vehicle, as well as the various payloads it might be expected to deliver, are being intensively explored at Norair. These investigations cover guidance, communications and position sensing systems, thermal and environmental conditioning, structural and material development and a host of other in-house capabilities. Expanded working groups in all essential areas are coordinating their efforts in the search for practical, integrated solutions to these problems.

This determination to research problems as thoroughly as possible, the ability to concentrate such a wide range of technologies toward their solution, and the added ability to translate the results into working hardware are prime assets of Norair in the space age.

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Newsletter

Armed Forces Management Association
Washington 25, D.C. MEtropolitan 8-1071

National President: Lt. Gen. Roscoe C. Wilson, USAF Exec. Vice Pres.: VAdm. Harry E. Sears, USN, ret.

ARMED FORCES DAY

Armed Forces Day to be held this year during the period 13-31 May affords an excellent opportunity for AFMA chapters and individuals to cooperate and assist the military services in the observance of this most important occasion. Armed Forces Day is the one official program conducted each year to focus attention on the military aspect of our National strength: Army, Navy, Air Force, Marine Corps, Coast Guard, Reserve Forces, and auxiliary organizations. As President Kennedy stated in his Inaugural Address while pledging himself and the nation to a quest for peace, "For only when our arms are sufficient beyond doubt can we be certain beyond doubt that they will never be employed." The assistance of the AFMA organization and its industry affiliates is earnestly urged to make successful the many open houses and community activities which will take place during the above mentioned period. To assist in these endeavors, fact sheets and other informational materials may be obtained at local Armed Forces offices and information services.

CHAPTER BRIEFS

Chicago-Great Lakes Chapter among its recent activities heard Mr. Byron Wien of Armour Research Foundation discuss "Effective Management Decision Making" at a dinner meeting held at Glenview Naval Air Reserve Training Center. This active chapter also co-sponsored and participated in the Business Research Conference conducted at Roosevelt University. John F. Burke is chapter head of Chicago-Great Lakes.

D. C. Science Chapter continues its fine program of scientific presentation. The group recently sponsored jointly with ASPA and SAM, a Management Roundtable on the subject of R&D Management Reporting. President of this unique chapter is P. Anthony Guarino.

Western New England Chapter—A recent dinner presided over by its president Lt. Col. Shadrach E. Davis, heard an interesting talk by James Low of the National Association of Manufacturers who spoke on the subject "Prescription for Good Leadership."

Fort Benning Chapter was honored to have Dr. Edwin D. Harrison, President of Georgia Tech as its recent guest dinner speaker. Dr. Harrison will be remembered as a principal speaker at the 1960 National Conference held in Atlanta.

Atlanta Chapter No. 24 was addressed by Commanding General Third U.S. Army at a luncheon held at Fort McPherson Officers' Open Mess. Lt. General Paul D. Adams gave an interesting discussion on "Practical Application of Management in the Army."

Great Salt Lake Chapter at a recent luncheon meeting had as its speaker, Charles Cordray, owner of Ogden Ford Sales, who spoke on "Management, or How to Get Things Done." Ralph P. Richardson is chapter president.

Gosport Chapter, at Norfolk Naval Shipyard, recently elected Captain William N. Price as its president, Waverly E. Sykes as vice-president, and F. M. Griggs as secretary-treasurer.

Atlanta Chapter had as its recent luncheon meeting speaker, Charles P. Johnson, Manager of Government Employees Exchange.

New York Chapter had an afternoon meeting on February 15 in which a discussion and demonstration of the latest techniques and developments in the field of Audio-Visual training, including closed circuit TV, were enjoyed by the membership. Colonel Earl Ashton is chapter president.

Fort Benning Chapter held a dinner meeting recently at which Brig. General A. D. Surles, Jr. was the guest speaker.

Chapter Standing. In the Association's annual competition reported last month, standings should be corrected to read: First place (Outstanding Chapter Plaque Winner): Atlanta Chapter No. 24; Second place: Atlanta General Depot Chapter No. 28; Third place and greatest improvement: San Antonio Chapter No. 17. These chapters are to be commended on the splendid programs and other activities which they have developed and engaged in during the past year. It is significant that the two top winners came from the same location, a command which had enjoyed the finest of support by the Army Commander and his staff for many years.

Bibliography

American Management Association, a valued corporate member of AFMA, has a wealth of management books, pamphlets and other periodicals in its *Management Bookshelf*. Recent addition is "Managerial Performance Standards," by Virgil K. Rowland, a handbook for line managers. Send for a copy of AMA Management Bookshelf listing all available publications of the Association.

Government Printing Office likewise carries many management type books which would be of value to line and staff managers. Also of interest: "Federal Careers in the Sixties," a directory for college students; GPO's library of six volumes on child care, all for one dollar.

Fall Conference

Put on your calendar now to attend the fall meeting, October 25 and 26 at the Sheraton Blackstone Hotel in Chicago. All events will be in the hotel. *Industry Members* should make plans for your exhibits *now* and budget accordingly.

Correspondence Course

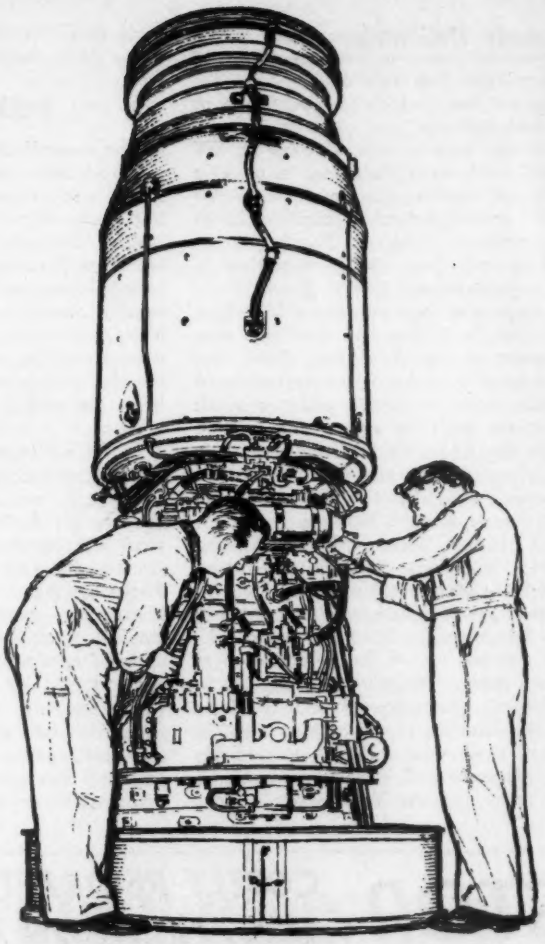
Many months ago, it was announced in the *Newsletter* that arrangements had been made for all members of AFMA (LCDR/GS-13 and above) so desiring, to enroll in the Industrial College of the Armed Forces' correspondence course, "The Economics of National Security." Christopher J. McLoughlin of Mohawk Chapter, Griffiss AFB, Rome, N.Y., says of the course:

"The course was both stimulating and informative and I sincerely recommend it to members of industry and government for it is very thought provoking and widens the horizons for those who wish to search for facts, ideas and new approaches to both old and new problem areas."

BS

AERO POWER

Olympus—for supersonic economy at Mach 2 plus



An advanced version of the Bristol Siddeley Olympus is now under intensive development for British Aircraft Corporation's TSR 2. It will give this very advanced tactical/support reconnaissance aircraft an economic performance at speeds up to Mach 2 and over.

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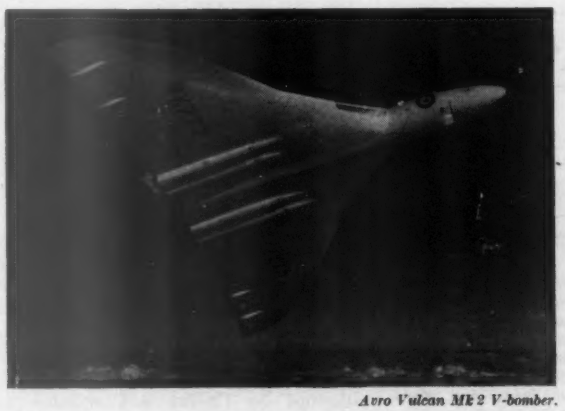
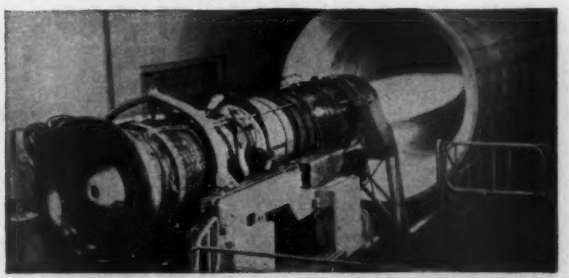
The truly astonishing built-in potential of the Olympus has been confirmed by the threefold increase in power from the 11,000-lb thrust dry of the original production engine, to the 33,000-lb thrust with reheat of the latest version.



Avro Vulcan Mk 2 V-bomber.



Olympus under test with reheat in operation

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The Olympus has proved itself in several years' service, as the powerplant of the Avro Vulcan V-bomber, to be one of the most successful turbojets ever built. Maintenance is exceptionally low—last year for example, on a 26,000-mile round-the-world tour, the maintenance required was almost negligible.

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(Continued from page 24)

bureaus, sanctioned by the Office of Naval Materiel.

Navy, which placed 15.5% in FY 1960 with small business, is pushing forward with a program in increased participation by small business in its procurement program. The key to its efforts has been its reorientation in "top-management down" direction.

Success of these efforts can be judged by the fact that for the first nine months of this fiscal year, Navy has managed to increase the percentage of prime contract awards going to small business firms by almost one percent over the figure for the same period in fiscal year 1960; and has managed to channel an additional $60-million into the hands of small business.

A distinct accomplishment by the Navy has been its attitude toward publicity of research and development requirements. Three media are being used to circulate this information: (1) widespread use of the Department of Commerce "Synopsis" to publicize, in advance, Navy requirements; (2) use of the facilities of the SBA to assist in locating sources; and (3) sponsorship of research and development clinics in areas outside Washington, where local firms can easily attend to learn about Navy requirements.

DEFENSE

The over-all Defense small business picture looks something like this: More emphasis on "break-outs"—taking parts of a sophisticated weapon system (formerly totally contracted for by large business and subcontracted to small business) and letting them to small business as the prime contractor. This applies to such things as small components in missiles and aircraft, missile containers, etc., when these items are within small business capabilities.

In the Defense Small Business Subcontracting Program, all large Defense contractors, not only the prime contractors but their large subcontractors, have developed and are conducting small business subcontracting programs. These programs vary from company to company depending on the type of Defense work each is engaged in, but all have certain standard features which are required by DOD. For example, each company, and for that matter each division or plant within the company, assigns one of its top officials as Small Business Liaison Officer. His responsibility is to make sure the required program is properly carried out within the company, division or plant.

Large concerns are required to make a report to DOD every six months showing the amount received by the company for Defense work, how many dollars were paid out to large subcontractors and how much to small business concerns as subcontractors and suppliers.

Whenever a Defense contractor involved in this mandatory program places a subcontract of one million dollars or more with another business concern, he must require that subcontractor to establish the same type of small business program in his own plant and make a similiar report to DOD. In this way every industrial concern in the country engaged to a sizable extent in doing Defense business will be in the picture, and the results should be beneficial in spreading Defense work around.

The Old Way

Before these programs were brought about, small business concerns as subcontractors and suppliers were receiving directly from the large prime contractor 15% of the value of their contracts. Today they are receiving 18% and 19% even though the weapons being built today are much more complicated than they were before.

These percentages are based only on the business placed directly with small concerns by the large prime contractors themselves. They also place about 32% of their total Defense dollars with other large concerns as subcontractors, who in turn use small business concerns as subcontractors and suppliers. Comprehensive reports on this "indirect" participation of small businesses are not yet available, but it is conservatively estimated that something over 25% of all prime contract dollars placed with large business winds up in the tills of small business concerns before the prime contracts are completed.

Note: Although there is presently no available means for determining exactly how many dollars go to small business by way of the large subcontractors, Army believes it has the solution in a contract article. Still in the planning stage, the article (if adopted by DOD) will require the contractor, in the performance of his contract, to submit reports each month to the Contracting Officer listing the total number of subcontracts in excess of $25,000 each and the total dollar value thereof awarded during the preceding calendar month to small business concerns.

Another method in Defense contracting, designed to help small business, is the "set aside" program—

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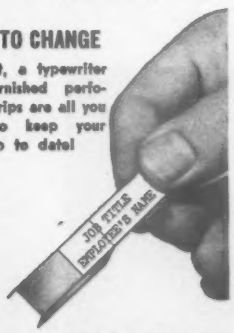

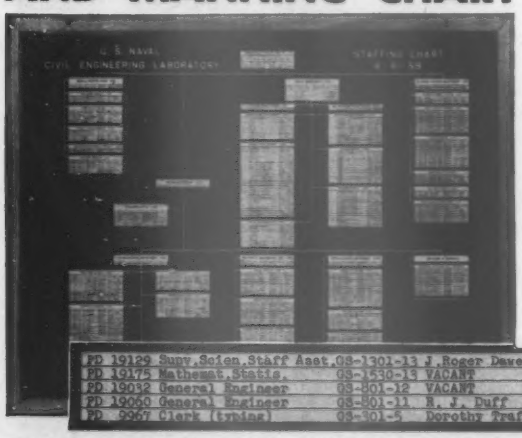

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wherein certain procurements are set aside for the exclusive participation of small business firms when it is believed that there is sufficient small business potential to insure competition. This program, which restricts large businesses from bidding on the contract, has resulted in more Defense dollars going to small business than has the break-out method.

SBA

The Small Business Administration, a seldom mentioned agency outside small business circles, is authorized (among other things) to grant loans to small business concerns to finance plant construction, acquisition of equipment, and supply working capital. Such loans may be made directly by the SBA or in cooperation with banks or other lending installations.

SBA also provides a valuable service to small business by making available to them technical and managerial aids and publications.

Small Business Administration representatives and military Contracting Officers jointly screen and select procurements that can be set aside for exclusive small business participation.

The SBA, under new Administrator John E. Horne and his Deputy for Procurement and Technical Assistance, Irving Maness, has two primary goals for the future: (1) draw more small business into the government program, and (2) assist small firms, especially in labor surplus areas.

In the past, the working relationship between government agencies and the SBA has been (according to people associated with the small business program) lacking "cooperative spirit." Another comment: "there was apparently too much lip service."

Changes are in evidence. Latest move of the SBA was to assign small business liaison representatives to each of the military departments. They will work hand-in-hand with the small business advisors of Army, Navy and Air Force at secretariat levels.

Commenting on the relationship in the past, Maness believes that the "open door" policy will break the barrier that has divided the SBA from other government agencies in the past. His door remains open at all times for his staff, government agencies, people interested in small business, or someone with a small business problem.

"Our aim for the future," he comments, "is to improve this relationship in an effort to support the President's program for improving and promoting small business, and rendering aid when possible to those companies in designated labor surplus areas."

The vigorous small business programs being conducted by the different agencies and DOD will affect more than just the percentage of funds going to small business. Programs have been set up to channel money, contracts and financial aid to those areas of labor surplus. Primary support of this will probably be drawn from the set aside program.

To assist small business in these labor surplus areas, modifications were made to SBA's Small Business Size Standards Regulations. Formerly, small business was classified solely as a concern employing 500 employees or less. The new regulation allows for a differential of 25% in the size standards used to determine which firms are eligible for SBA financial, production and procurement assistance.

The change is intended to expand the number of firms in substantial labor surplus areas eligible for aid under SBA programs in order to provide additional business opportunities and employment in these hard hit areas.

The future outlook for small business concerns, as well as the programs being conducted for labor surplus areas, is for a percentage climb in the Defense small business program, which in turn will offer substantial relief in the surplus areas. ■

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In My Opinion

In March, AFM ran a letter in this column from Maj. Alan D. Briggs regarding the "Fourteen Erroneous Postulates" by Leland B. Kuhre. We put out a feeler to see what other comments we could get on this subject. Here they are:—Ed.

The Colonel's (Col. Kuhre's) articles are pure gobbledegook.

LCDR L. K. Pomeroy, Jr., USN
CINCUSNAVEUR Staff, B-5

Please extend my sympathies to Maj. Alan D. Briggs in his efforts to unravel "Erroneous Postulates." I also sympathize with the author, who no doubt has some merits to his arguments, but who has failed almost totally to communicate them. His style of writing alone is a tremendous handicap.

Bernard A. Koteen
Comptrollers Office U.S. Army

I agree with the letter in the March '61 issue in the "In My Opinion" column as to the complete confusion which was successfully perpetrated by the author of the "Erroneous Postulates."

(Requested name be withheld)

I thoroughly enjoyed Colonel Kuhre's "Erroneous Postulates." This type of thinking and writing calls for continued study, critical analysis and further understanding.

Major Marvin J. Hout, USAF
Woodbridge, Va.

Your publication of "Erroneous Postulates" represents a real contribution to thinking in an area that has lain dormant since Alexander the Great.

We need concepts and ground rules that will promote, rather than stultify, the productive efforts of large bodies of free men, bold men, learned and capable men, and Colonel Kuhre seems to be the only person yet to achieve scientific detachment in his studies and findings.

Louis W. Jones
Management Analyst
U.S. Naval Radiological Defense Laboratory

I read Major Alan D. Briggs letter concerning the "Erroneous Postulates" series. The fact that he didn't understand the articles and didn't even try to understand them indicates (to me) that he is not a student of logic, philosophy, semantics, psychology or mathematics.

Colonel W. W. Ragland, CE
Headquarters, 7th Army

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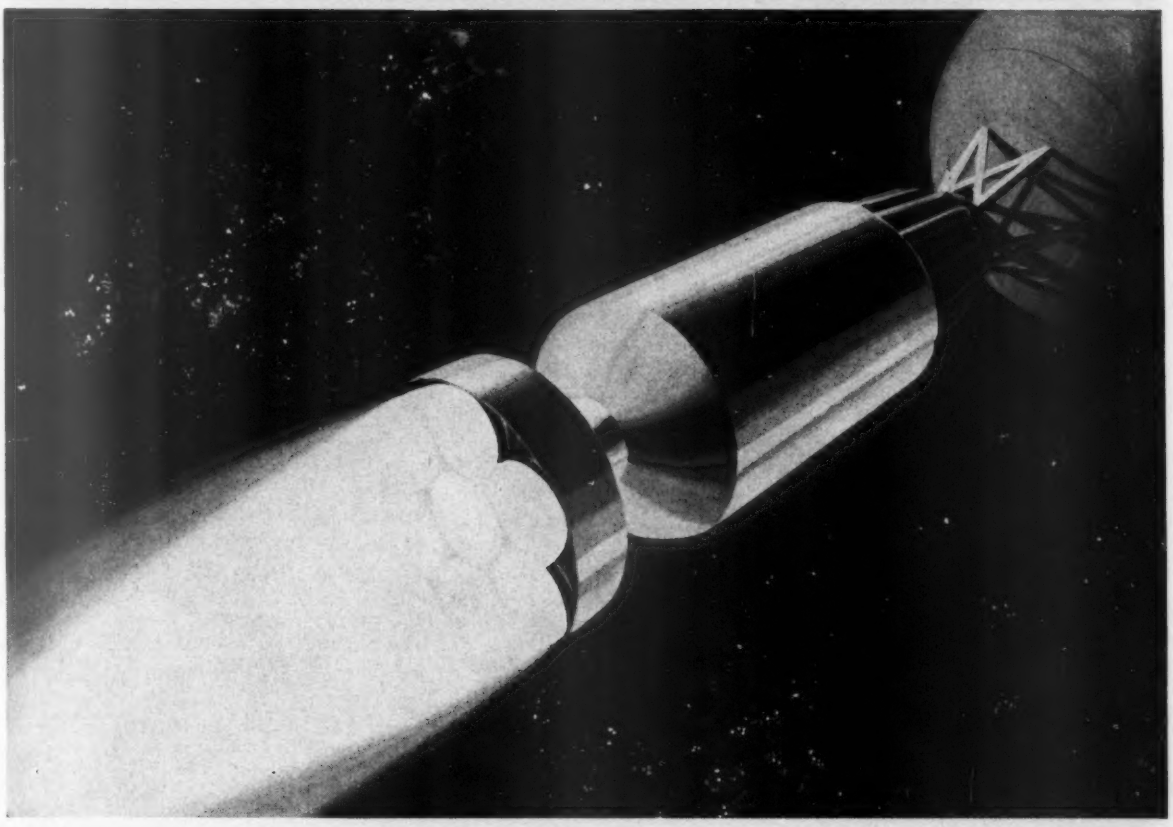

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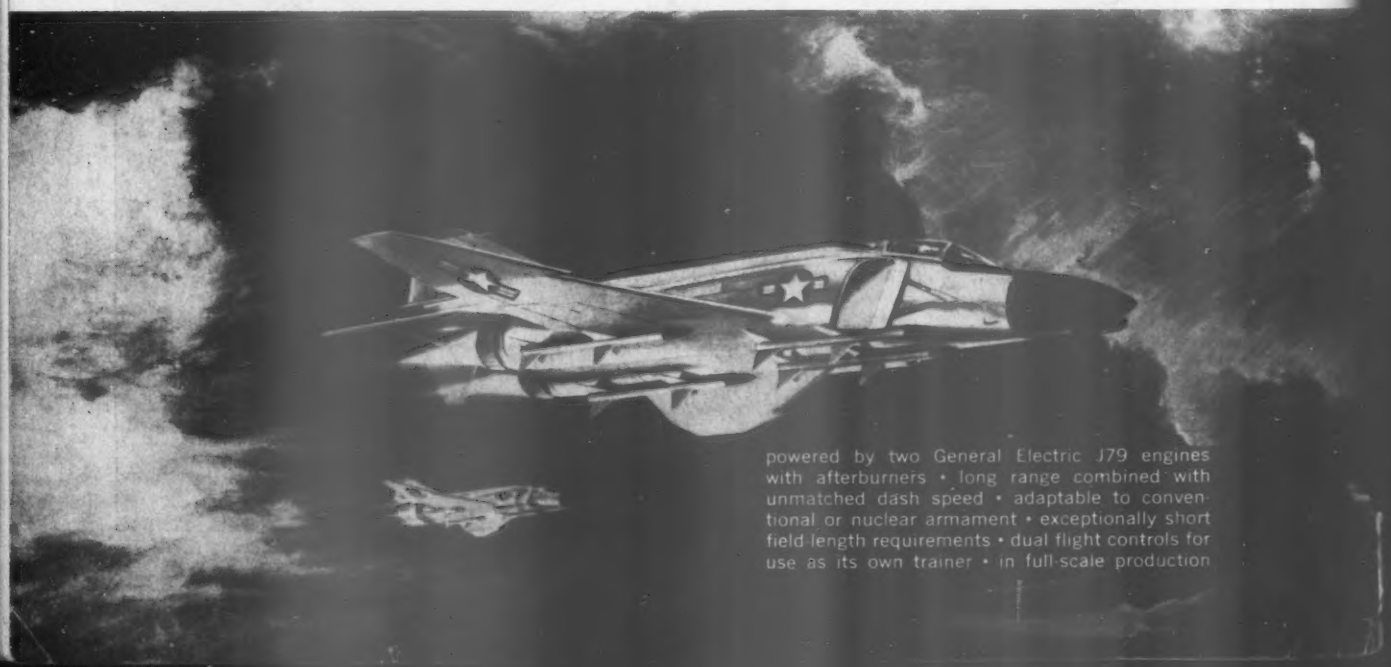

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